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ABSTRACT

The development and application of the idea of microteaching in research and education is described in this report. It examines the use of different feedback devices for self-control and self-direction. The main conclusions reached are: (1) externally mediated self-confrontation via CCTV/VR is a therapeutic treatment; and (2) microsetting models still are without theoretical foundations. (Author/WCM)

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Explorations and experiments in microsettings

Bernhard Bierschenk

U.S. DEPARTMENT OF HEALTH
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The main conclusions reached are (1) that externally mediated self-confrontation via CCTV/VR is a most important factor in connection with training programs and therapeutic treatment and (2) that microsetting models have been and still are without theoretical foundations which means among other things that despite extensive studies, it is still uncertain how much significance these models should be allotted.

Keywords: Self-confrontation, cybernetic model, microsetting, audio video lab. experiments

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INTRODUCTORY POINTS OF VIEW

This report has been commissioned by UNESCO. It consists of an examination of previous studies and presents results that should shed light on ways of using closed circuit television (CCTV) and video-recording (VR), together with the application of the microsetting models, in clinical, therapeutic and educational contexts.

Initially, an outline is given of the development of a new model for the improvement of teaching: microteaching. Starting with system-theoretical considerations, an heuristic model is presented for a study of the self as governor of the behavior of a purposeful individual. On the basis of this model, it should be possible to study systematically how the individual makes use of various feedback devices for self-control and self-direction.

In connection with the model, the implications of the concept ´self´ are discussed, particularly in externally mediated self-confrontation. The concept of ´self´ is here regarded from a phenomenological point of view, that is to say as a system of learned experiences, which the individual has had in relation to other people or in relation to non-personal objects. This method of attacking the problem assumes that each individual has a basic image of himself and that this basic image influences the individual´s ability to behave in a particular way in different situations and on different occasions, that is to say, the behavior of the individual becomes predictable. Nonphenomenal constructs, e.g. the unconscious self-concept, will be considered only occasionally.

The second fundamental condition on which this report is based is the hypothesis that life is confrontation. The concept of ´confrontation´ was chosen as being the most significant link that joins the investigations that have been examined in this study. Confrontation in combination with the word self means to come face-to-face with or stand in front of one´s own character. But it also means to bring close together for comparison or examination.

Thus becoming aware of oneself requires that one can integrate experiences into a conscious "self". This process implies confrontation (conflict) and the psychologically interesting result of this confrontation is the steering role of the "phenomenal self" in determining individual behavior. While this confrontation is in early childhood direct, it gradually becomes more and more of a confrontation with systems of symbols. By using his own person as a focussing point, the individual should be able to utilize himself as a research instrument. Many people are not aware of this process. If we were able to make the individual aware, his life would gain in coherence and his Ego in strength.

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With this theoretical foundation, the model is then applied in an examination of research results concerning "externally mediated self-confrontation via CCTV/VR", in which the individual's self provides the frame of reference.

Another frame of reference in the self-confrontation process may be external to the individual. Tutors provide in teacher training a model against which the student teachers have to judge their own performance. A number of investigations carried out in order to study the effect of externally mediated self-confrontation with and without stipulated models of behavior have been examined.

In conclusion, an account is given of how far the idea of microteaching has spread, to what extent it has been accepted by researchers and educators, and to what extent it has been applied, together with whether the expectations that have been coupled with the model have been fulfilled.

Finally it should be pointed out that a strictly controlled analysis of the research reports has not been feasable within the framework of this study. Considering the data collection technique and the measuring instruments used, it seems as if the only suitable method of analysis would be the "poor man's factor analysis", carried out in order to extract the common denominators of the research reviewed.

1. SCOPE OF MANUAL AND COMPUTER-BASED SEARCH FOR LITERATURE

In 1967 a research project was started at the Department of Educational and Psychological Research of the School of Education in Malmö (Sweden) with the aim of studying the effects that externally mediated self-confrontation via closed circuit television and videorecording has on the way in which student teachers experience their own teaching in the form of microlessons, compared to the effects of the traditional form of tutoring.

The first step of the investigation has naturally been to get a general view of the educational and psychological research literature that exists on the use of closed circuit television and videorecording in educational contexts. Access to the research literature that is relevant to the problem is obviously of great importance for the process of problem formulation and the shaping of a suitable design for the investigation. But one of the more difficult problems to solve appears to be gaining access to the literature that is "relevant" during the various phases of the investigation process.

The bibliographic mapping carried out in connection with the project mentioned above was from the start restricted to manual seeking. In the search for relevant information, 24 journals and bibliographies containing articles in English and German, covering the period 1959-1970, were studied (Bierschenk, 1973 c, p. 5). Searching for literature by means of secondary sources, for example, presents two difficulties, which both manual and computer-based seeking have in common, namely

1. planning a search strategy, which is sufficiently general, i.e. encompassing all "suitable" concepts or terms and
2. planning a search strategy, which is sufficiently specific, i.e. excluding all "unsuitable" concepts or terms.

In our attempt to study the reference lists systematically, the following key-words were used in the manual search: Educational Television (ETV), Instructional Television (ITV) and Closed Circuit Television (CCTV).

It is impossible to say whether these "search terms" have been the most suitable ones for the examination of the subject indexes of the reference lists, since this question is linked up with both the discrimination level of the information system and with the bibliographic control or control mechanisms of the individual systems. The search has led to a large number of "relevant" references which have been systematized in the form of special bibliographies (Bierschenk, 1969, 1971 a, 1971 b).

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The behavioral science disciplines in Sweden did not have the possibility of seeking literature with the help of computors until 1971. A computer-based search for literature was carried out in the "Research in Education" (RIE) and "Current Index to Journals in Education" (CIJE) data files, both as a continuous registration of newly issued publications and retrospectively by means of a computer-based search in the data base "Psychological Abstracts", covering the period 1969-1972 (Bierschenk, 1973c, pp. 7-8). This search has led to approximately 450 relevant references, which have been systematized in the form of a special bibliography (Bierschenk, 1973 c). In addition about 60 references have been obtained from the International Microteaching Symposium held in Tübingen (Germany) in 1972.

This extensive search for literature has resulted in about two thousand references. An enormous amount of work would be required for all this literature to be studied and the reported results presented. For this reason, the aim has been to structure the research results, so as to make them easily accessible.

The following three questions have guided the work: What effects does externally mediated self-confrontation have on the individual's (1) perception, (2) evaluation and (3) behavior.

In order to make this review reasonably comprehensible, a representative sample of the studies has been taken. For each study is stated the hypothesis of the study and the results presented. The type of population involved usually emerges from the context in which the study has been conducted. No attempt has been made to structure the results of the investigations in accordance with the dependent variables of the investigations, as this lies outside the scope of this study.

2. DEVELOPMENT OF A NEW MODEL FOR IMPROVING TEACHING: MICROTEACHING

The importance of the discovery of the opportunities opened up by the use of closed circuit television (CCTV) and videorecording (VR) in the field of behavioral research was compared at the beginning of the 1960´s with the discovery of the opportunities offered by the use of the microscope in biology. A few years later (around 1966) "microteaching" was presented as a model for training teaching behaviors under controlled conditions. In short, behavioral research appeared to have acquired a "microscope" and a "laboratory" and thereby to be equipped with a new instrument of analysis and a new model for process analyses in the behavioral sciences that should lead to a better understanding of intraindividual and interindividual processes. Gregory (1970, p. ii) has written that "microteaching is one of the brightest innovations spawned in teacher education". This statement, which is typical of many others, is based on the conviction that the model can be used effectively to accomplish genuine changes in behavior and that experienced teachers taking further training courses experience a genuine renewal of their own teaching style and an improved skill in the analysis of teaching processes.

When CCTV/VR techniques have been used in combination with microteaching, the confrontation aspect, more precisely confrontation with one´s own video-recorded behavior, has been identified as of major importance for the individual´s self-improvement and development of desirable patterns of behavior. (Ivey, 1971, p.126.)

As Gregory (1970, pp 16-17) points out, teachers must be good judges of both their own and their pupils´ behavior and performance. But unfortunately the teacher experiences far too often that he finds himself in a situation where no learning process appears to take place, despite all his teaching efforts. Quite naturally, the first question that the teacher usually then asks is "Why?". The answers given to this question by both experts and laymen are as varied as they are numerous. Educational experts also try to supply catalogues of recommended measures, that is to say suggestions for suitable solutions. Even though these patent solutions are given in good faith and even though they are based on many years´ teaching experience and therefore should not be without value, they seldom answer the question "Why?". In addition the complexity of the learning process does not allow overall generalizations and these are felt by many to be of dubious value.

In this context the microlesson model has proved to be of great use in making explicit the fact that teaching is characterized by a high degree of ego-involvement and that it is necessary for the teacher´s often unof closed circuit television (CCTV) and videorecording (VR) in the field of behavioral research was compared at the beginning of the 1960's with the discovery of the opportunities offered by the use of the microscope in biology. A few years later (around 1966) "microteaching" was presented as a model for training teaching behaviors under controlled conditions. In short, behavioral research appeared to have acquired a "microscope" and a "laboratory" and thereby to be equipped with a new instrument of analysis and a new model for process analyses in the behavioral sciences that should lead to a better understanding of intraindividual and interindividual processes. Gregory (1970, p. ii) has written that "microteaching is one of the brightest innovations spawned in teacher education". This statement, which is typical of many others, is based on the conviction that the model can be used effectively to accomplish genuine changes in behavior and that experienced teachers taking further training courses experience a genuine renewal of their own teaching style and an improved skill in the analysis of teaching processes.

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In this context the microlesson model has proved to be of great use in making explicit the fact that teaching is characterized by a high degree of ego-involvement and that it is necessary for the teacher's often unconscious behavior to be put in relation to the behavior that has been made conscious. In-service trainees in particular are here given the opportunity under "riskfree" conditions of taking the first steps in learning to self-evaluate their own teaching behavior.

The distinguishing feature of microteaching is that it demands of the trainees that they learn to incorporate teaching strategies in short lessons. The trainees must thereby carry out systematic observations and analyses that are then made the foundation for the introduction of new strategies that are based on principles of behavioral science.

Many new teaching methods and strategies have in common that they are based on teaching about processes, including the solving of problems. These require to a particularly high degree that the trainees are given first-hand information if they are to be able to learn how one gains insight into complex teaching processes and if they are to be able to develop teaching strategies adapted to the individual.

The introduction of new media and new experimental techniques such as CCTV/VR and microteaching necessitates a simultaneous intensification of our efforts to follow up this process with systematic studies. Well-founded knowledge and extensive training are needed if the new technology is to be efficiently applied in such a way that it will lead to improved teaching.

Educational and psychological research and higher education have since the beginning of the 1970's more and more made use of various "microteaching models", which will hereafter be gathered under the common name "microsettings". Microsettings permit the scaling down, under controlled conditions, of complex situations in educational and advisory activities (e.g. counselor training, counseling, pupil welfare etc.).

The model was originally designed at Stanford University in 1963 by Allen and Bush, in connection with "The Stanford Teacher Education Program" and became known under the name of "microteaching". Ivey (1971) used the same techniques in the development of interviewing skills. Microcounseling has been presented as a training device which can be an important complement to existing training models. Ivey (1971, p. 14) writes:

> "The focus on specific skills as opposed to the totality of the interview allows one to approach the interview more analytically and to develop ... a more sophisticated understanding of one's own skills and limitations."

Microsettings are models which are defined by the following basic elements:

1. structuring of the components which define a teaching or advisory situation
2. reduction of an ordinary teaching or advisory situation with regard to the number of participants, the range of the subject and the length

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Microsettings are models which are defined by the following basic elements:

1. structuring of the components which define a teaching or advisory situation
2. reduction of an ordinary teaching or advisory situation with regard to the number of participants, the range of the subject and the length of time

3. focusing of different skills and strategies plus demonstration of models
4. feedback of different types of information with regard to the separate components that are included in a teaching or advisory situation
5. evaluation of courses of action and strategies with regard to intentions or specified plans.

The model has attracted international attention and has been applied in a multitude of variations. Although no link between CCTV/VR and microteaching was intended from the start, developments have shown that CCTV/VR is the most important component in microsettings for providing the trainees with opportunities for making systematic inquiries into their own personalities and behavior and their own effect on the behavior of the pupils or client.

Together with CCTV/VR techniques, microsettings have come to be used in many different training areas. The development of this model started in subject teacher training (Allan & Ryan, 1969), from where it spread to class teacher training (Young, D., 1967), the in-service training of university teachers, such as doctors of medicine, engineers etc. (Perlberg et al., 1968; Cotrell et al., 1971), long-distance teaching (Meier, 1968), in-service training for teachers (Borg, 1968), psychologist training (Ivey, 1971), air hostess training (Lawrence, 1972), training of Peace Corps personnel (Comstock & Maccoby, 1968) and in internal business training (Harwood, Henley, Portnoff & Polli, 1973).

The classical model of microteaching is a training technique that has from the start been used in the practical training of student teachers or teachers. As a start 5 to 8 pupils were usually used. The pupils are either paid or are taken from demonstration schools. Peers or colleagues can also function as "pupils" in so-called peer-teaching. The length of the lesson is usually limited to 5 to 10 minutes. The development has been, however, for larger groups of pupils to be used (ranging between 4 and 30). On an average the number of pupils is over 10. As far as the length of time is concerned, lessons of between 15 and 20 minutes are usual, although periods of 5 to 10 minutes also occur. With regard to the content of the lessons, there is a very great variation from the training of skills (e.g. Stanford-Skills) to the training and analysis of complex subjects, such as leading a discussion or starting and checking group dynamic processes.

It is not so easy to experiment with different teaching or advisory forms in traditional education. As Cohen (1969, p. 48) showed, neither class teachers nor the practice school are particularly pleased when a student teacher wants to try out new methods, since both are responsible for the continuity of the pupils' education. Ivey (1971, p. 11) writes: "However, teachers, counselors and interviewers usually learn their skills components that are included in a teaching or advisory situation

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In this context microsettings appears to have a very important function.

The psychological interpretation of teacher and pupil behavior is of major concern in the use of microsetting models, which may be useful in redefining the meaning of teacher and pupil behavior, by means of viewing a behavior from alternative frames of reference and facilitating direct mutual communication. That may be a way of overcoming the resistance that has been generally experienced against the training of single skills.

The observation of the teaching process under experimental conditions is considered as a valuable improvement in higher education. Perlberg (1972, p. 46) considers, for example, that it is unrealistic to expect university teachers to participate in prolonged pedagogic courses and seminars when there is no guarantee that participation will lead to a change and an improvement in their own teaching. The desirable factors in all teacher training are the ability of the trainees to analyze, interpret, evaluate and communicate. Perlberg's (1972, p. 47) results in an investigation of the use of microsetting models within teacher training was that "microteaching clinic sessions" were the best predictor of "openness and willingness to accept innovation".

The combination of microsetting techniques with systematic observation and diagnostic feedback system is another area requiring further research. These models provide a framework for alternative methods of teacher education.

A common international opinion is that the establishment of teaching laboratories would be very useful for a successful application of this model (see e.g. Gregory, 1970; Bierschenk, 1972; Perlberg, 1972).

3. A CYBERNETIC MODEL FOR THE ANALYSIS OF SELF-CONFRONTATION PROCESSES

Many situations involving (1) a tutor or counselor, (2) a trainee or student teacher and (3) goals or aims could be systematically described in the following way: The tutor discusses in a counseling situation on the basis of a plan of behavior, a strategy of action. The trainee on the other hand works from the basis of certain concrete actions and strives towards the goal of developing a strategy of action and finally a plan of behavior. But even if tutor and trainee start from different positions, they are working towards the same goal, namely to develop suitable plans of behavior. Many inter-personal behaviors, however, are probably unconscious or automaticized, which means that it is often very difficult to discuss the behavior of a certain individual in a given situation. One of the ultimate goals of education and counseling is to achieve modifications or extensions of patterns of behavior. This requires a focussing of attention on both the automaticized and the non-automaticized components in a behavior.

The outline sketched here is based on the assumption that the individual evaluates himself as an instrument for achieving a goal. But an action carried out according to plan does not just come into existence. It is developed out of a more or less vague "idea".

An idea is literally defined as an element of consciousness, an element which is inevitably included in any plan. On the basis of an idea, the individual shapes a conception or image of objects and relations. An image is defined by Miller, Galanter & Pribram (1970, p. 17) as:

"... all the accumulated, organized knowledge that the organism has about itself and the world."

As a result of experiences, upbringing and education, the individual has developed idiosyncratic images or representations, which include facts, values, concepts and conceptualizations. As can be seen from this definition, an image contains nothing that can be called a goal or aim. If an image is to be used in guiding the individual's behavior, it is necessary for the individual to develop a plan.

A plan is defined by Miller et al (1970, p. 16) as

"... any hierarchical process in the organism that can control the order in which a sequence of operations is to be performed."

This definition implies that the individual must make use of criteria when assessing the extent to which the actions carried out are in agreement with the goals and aims of that individual. These criteria may be defined as the individual's intentions. Miller (1970, p. 2) writes:

"It seems as if a plan is needed in order to exploit the image."

Many situations involving (1) a tutor or counselor, (2) a trainee or student teacher and (3) goals or aims could be systematically described in the following way: The tutor discusses in a counseling situation on the basis of a plan of behavior, a strategy of action. The trainee on the other hand works from the basis of certain concrete actions and strives towards the goal of developing a strategy of action and finally a plan of behavior. But even if tutor and trainee start from different positions, they are working towards the same goal, namely to develop suitable plans of behavior. Many inter-personal behaviors, however, are probably unconscious or automaticized, which means that it is often very difficult to discuss the behavior of a certain individual in a given situation. One of the ultimate goals of education and counseling is to achieve modifications or extensions of patterns of behavior. This requires a focussing of attention on both the automaticized and the non-automaticized components in a behavior.

The outline sketched here is based on the assumption that the individual evaluates himself as an instrument for achieving a goal. But an action carried out according to plan does not just come into existence. It is developed out of a more or less vague "idea".

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It is important for the development of a plan of behavior that it is kept flexible. The individual must have the possibility of choosing and be able to investigate whether the effects of the first action really are in agreement with what was intended. If, on the other hand, the separate steps in a sequence of actions follow each other automatically in the realization of a plan, the individual can be said to be acting without any degree of freedom, or routinely.

Once the individual has developed a plan of behavior, a strategy of action must also be developed. A strategy of action consists of the integration of molecular units of behavior (e.g. skills, moves, tactics etc) in a molar unit of behavior. Miller (1970, p. 17) defines a strategy as "the molar units in the organization of behavior."
A strategy of action consists of the individual's decision on suitable methods of approach and choice of aids for the realization of the goal.

The ability of human beings to perceive a changeable environment provides them with the opportunity of both comparing their own actions with their anticipated actions, and comparing their patterns of behavior with what they intended in a plan. The patterns of action can then be modified, depending on the degree of congruence between intention and action. But this means that the goals or intentions can also be altered.

On basic condition for the educational process is that plans of behavior, strategies and single actions can be successfully communicated. In an educational context the objective of a planned influence is very often to achieve behavioral modifications (e.g. the learning of a new skill) in an individual (e.g. a trainee). This process usually starts with someone, e.g. a teacher of methodology or pedagogics, trying to mediate a "communicable" plan, consisting of pedagogical, psychological and/or methodological instructions. This does not, however, necessarily mean that the trainee has been able to follow the presentation. Still less does it mean that the trainee has developed new criteria for perception and evaluation or acquired "correct" behavior.

When, for example, a teaching process is analysed with a cybernetical model as starting-point, this means that the different components in the model do not react to each other solely in a mechanical ping-pong manner, but instead each in a relatively active way contributes to the development of the on-going teaching process. Each individual interprets the situation in the context of his own frame of reference. Guided by this interpretation, the individual then chooses or decides upon a certain action. This presupposes plans and strategies, irrespective of how fragmentary and unpolished or logical and well-reasoned these are.

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The successful development of suitable plans of behavior requires methods of seeking information or finding facts which permit a structuring of a plan of behavior. The search for information necessitates not only active behavior, but also purposeful behavior. Rosenblueth, Wiener & Bigelow (1968, p. 221) write:

> "The term purposeful is meant to denote that the act or behavior may be interpreted as directed to the attainment of a goal, i. e. to a final condition in which the behaving object reaches a definite correlation in time or in space with respect to another object or event."

From the scientific point of view, very little is in fact known about the way in which people acquire knowledge of their environment and the way in which the perception and evaluation process is related to behavior. According to Frank's (1962) psychological information model the process of acquisition of information consists of two phases. In the first phase, incoming information ("informal accommodation") is adapted for an optimal coding of external and internal messages. The optimally coded information is stored in a short-term memory and is subjected in the second phase for the process of apperception. Based on this model, perception is defined as the selection, structuring, evaluation and accentuation of information.

Information seeking is necessary for the individual to be able to develop a structured plan of behavior. But it is also necessary that the goal for an action can be related to the total setting and that a suitable method of approach can be defined. If a search for information is to be effective, it must be linked with the strategy of action itself. Thus, the search for information has to be part of a feedback system.

This freedom of choice presupposes that the individual can choose between available or potentially available actions. A choice has been defined by Ackoff & Emery (1972, p. 37) as

> "An individual's or system's production in a structural environment of one or two or more structurally different but functionally similar acts of which the individual or system is a potential producer in that environment."

In modern system research, which is tied to cybernetic principles, the basic principle that all processes of information are processes of choice has assumed growing importance. The use of cybernetic models in the analysis of the individual approach to and efficiency in choosing, categorizing and storing available information has become increasingly common. This has also led to interest no longer being concentrated solely on different forms of information and on learning structure, but to an ever greater extent on the effectiveness of the communication. The individual's subjective interpretation of a given situation and consequent action is to be examined within the framework of the new model.

The criteria which the individual makes use of in assessing the extent to which goals and aims have been achieved are defined as the level of aspiration.

The level of aspiration indicates how far an individual has succeeded or failed in fulfilling criteria either defined internally by the individual himself or defined externally by someone else.

The belief the individual has in his ability to carry out a particular action in order to reach a goal or his belief in the existence of objects and relations that can be of importance for achieving a goal can be defined as "the relation between the individual's belief in the existence of things and the result that the individual attempts to achieve".

Following this discussion, it can be said that the operational phase in the execution of a plan of behavior leads to a strategy of action, while the test phase is dependent on the images of the individual. Thus, the values that the individual has or has learnt are made use of in the test phase.

In this context, however, it should be pointed out that human behavior is much more complex than it appears to be in the description and definitions given above. Hypothetically it should be possible to decide the entire action complex by means of a "plan", which would include all expected reactions and possible disturbances. The assumption that human strategies of action follow a certain plan has led to a new theoretical starting-point, which was presented by Miller et al (1970) and is called the "Test-Operate-Test-Exit" (TOTE) paradigm. The paradigm is considered to be an important contribution to a theory of learning (Heinich, 1968, p. 148).

The first step in a cybernetic analysis of a particular problem consists of deciding the different components of the cybernetic model, together with input and output data, which are linked by means of a feedback loop.

Feedback-looping permits not only self-regulation but also makes possible self-direction or at least adjustment to a changeable environment. The original subject of the cybernetic research was the perceiving and thinking person, acting by plan. The application of cybernetical principles in behavioral research makes it necessary to try to objectify a person in his functions. This view has been expressed by Cattell & Warburton (1967, p. 5) as a

> "personality sphere concept designed systematically to cover the gamut of personality expression".

Ackoff & Emery (1972, p. 34) write:

> "We believe that no concept of personality can melt the criterion of uniqueness unless it represents the psychological individual as a purposeful individual and locates personality in the response of an individual to his environment."

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This view is rooted in the psychology of communication. The person is regarded as a purposeful individual (or system), gathering and processing information. However, the theory is not restricted to general assertions about the human being, but can very well be made the foundation for a more detailed description of a particular individual's approach in mastering a specific task. Warr & Knapper (1960) did this with regard to the individual's perception, while Ackoff & Emery (1972) presented:
"An interdisciplinary analysis of individual and social behavior as a system of purposeful events".

In summarizing it can be said that the basic theory for this methodological approach is that behavior modifications presuppose a structural change in the individual's field of perception and his structure of values and beliefs.

Lewin (1968, pp. 441-444) investigates in connection with social diagnosis and the analysis of patterns of action the possibility of treating social actions as "plans". The conversion of more or less well defined thoughts and ideas into a plan assumes in his opinion the following steps:

1. to define (clarify) aims
2. to define the route to the goal and available aids in achieving the goal and
3. to develop a strategy of action.

Lewin's idea is in general agreement with the outline presented above, since his steps define a "plan" and a "strategy" which must exist before the performance of purposeful behavior. The TOTE paradigm's application within research in the behavioral sciences can be seen as a heuristic model that facilitates the understanding of the individual's performance based on learned information.

A model based on the TOTE paradigm is presented in Figure 1 for a study of self-confrontation processes in micro-settings. A fundamental feature of the cybernetic model is a circular flow of information. This is indicated by connecting lines. In the cooperation between on the one hand the individual's perception and evaluation and on the other the individual's self, which has a guiding and controlling function, a purposeful transformation of information to action anticipation is made possible. The organism transforms the information into behavior in order to materialize the plans of behavior. Depending on one's aim with a model, one can introduce more or less substantial restrictions on the model, i.e. the number of parameters. In this study the model is restricted to perceptive, evaluative and behavioral outcomes. Each of the components in Figure 1 could naturally be divided up into a large number of sub-systems. It should also be mentioned that a molecular unit of behavior is not easily defined.

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One purpose of this study is to examine the extent to which the individual's "self" can be exploited and has been exploited for the purpose of training teachers and counselors who continually use feedback techniques to try out, test and modify their own behavior. "Self" denotes the experiences that the individual has had of personal and non-personal objects and that are assumed to form the foundation of the structure of the individual's personality. The technical import given here to the concept "self" implies that the individual's personality is built up of learned self - others relations and relations between the individual's self and non-personal objects.

Combs & Snygg (1959, p. 17) write that that which controls a behavior, seen from the individual's point of view, is his unique perception of himself and the environment in which he lives. The individual's way of perceiving and evaluating different objects and environments defines to a great extent his behavior. People do not behave in agreement with facts such as these are experienced by other people. People behave in agreement with facts such as they themselves experience them.

Figure 1 states both external criteria in the form of stipulated models of behavior and the individual's internal criteria in the form of plans, images and value or belief systems, which form the individual's levels of aspiration. For if there is no criterion, it is not possible to judge whether an action has been an advance or a regression. Only the interplay between criteria and the individual's operations can enable a judgement to be made of the relation between an effort and a performance. In this way the purposeful individual can avoid erroneous conclusions and the establishment of undesired plans and strategies.

Figure 1 contains the TOTE unit "self", composed of three subordinate TOTE units: (1) images, (2) values and belief, (3) strategies. In its simplest form the TOTE paradigm means that the actions of the individual are guided by means of continuous testing of the organism's (system's) output data. TOTE units can operate on many different levels of complexity. The feedback loops between e.g. "Images" and "Change in structural properties of images" represent the relation between an image and an action. The test phase in TOTE implies, on the level of complexity we are working with, a process which determines that the performance of the operational phase is suitable. The operational phase contains for this level of complexity both tests and operations, which means that there must be many more tests and actions. The fact that different individuals possess different images and systems of value and belief, which do not wholly coincide, could be a possible explanation of the general loss of information, which appears as soon as individuals function as channels experiences that the individual has had of personal and non-personal objects and that are assumed to form the foundation of the structure of the individual's personality. The technical import given here to the concept "self" implies that the individual's personality is built up of learned self - others relations and relations between the individual's self and non-personal objects.

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The result of the individual's (1) image and the direction in which a certain situation is changed when a plan of behavior is carried out, (2) perception of the situation in question after the action has been carried out and (3) image of the situation that the individual wishes to achieve decide the size and tendency of a possible change. In order for an individual to be able to verify an existing image it is necessary for the individual to make (4) predictions, which implies that the usefulness of images is tested (Miller, 1970, p. 175).

Feedback loop s_3 symbolizes the information which the individual gets from (1) an externally mediated self, or (2) a stipulated model of behavior and (3) the individual's microenvironment, e.g. microsettings. If a balance is to be achieved between e.g. the self-image of an individual and the externally mediated self-image of that individual, there must be such differences as can be discovered by that individual. What is most important is that an incongruity in the structural properties of the images can result in changes in the internal representation of the individual's self-image. Since the communication of information can create incongruity in the recipient's cognitive structure, the balance theory (Heider, 1946) provides a general frame for a study of the process of self-confrontation. But if the individual is to be able to experience a difference, this must be of a form and quantity that an incongruence between the levels involved really can be discovered. It is a generally known fact that the threshold values for "just noticeable differences" (JND) varies greatly. Information that is fed back to the individual must therefore be of varying form and quantity for it to be possible for the individual to discover similarities and dissimilarities between the individual's self-image and the self-image which is externally mediated.

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The study of different threshold values in individuals is a psychophysical problem. But unfortunately the psychophysical research which is of interest for a cybernetic system has so far not produced any results that are of use in this context. Within a feedback system the JND linked with such a system become a much more complex phenomenon than the JND that are usually investigated, where one is interested both in absolute threshold values and the differences within these (Notterman & Trumbull, 1968, pp. 351-353). If a deviation is discovered, it must also be identifiable, i. e. the individual must be able to decide successfully the form and quantity of the deviation. If the individual concerned cannot define deviations, this leads to a general, unspecified action. The inability to reduce a deviation leads to massive and inconsistent actions, which can naturally lead by coincidence to a reduction of the differences between e. g. the individual's internal self-image and the externally mediated self-image. But the inability to identify can also lead to increasingly desperate behavior, which is a well-known phenomenon within the field of experimental psychology of frustration.

The theory of balance, which has attracted most attention and which to a greater extent has initiated empirical research, is Festinger's theory of dissonance (Festinger, 1957). According to Festinger (1963, p. 17) people show an impulse towards consistent behavior. If inconsistency arises between images and behavior, a communicative action emerges to reduce the difference that has been experienced. The fundamental argument put forward by Festinger (1963, p. 19) is:

> "Any time a person has information or an opinion which considered by itself would lead him not to engage in some action, then this information or opinion is dissonant with having engaged in the action. When such dissonance exists, the person will try to reduce it either by changing his action or by changing his beliefs and opinions. If he cannot change the action, opinion change will ensue."

The psychophysical process that is called dissonance-reduction gives the person opportunities for changing or justifying his own behavior.

Finally, Figure 1 also presents s_1, the effect or interference of signals from the environment. The individual creates to a large extent his own individual environment. But psychological processes are developed through interplay with the interindividual environment. The feedback alternative mentioned has the following import:

Symbol	Import
s_1	Deviations that are caused by disturbance values, i. e. a number of indefinable factors that are usually given in studies as error variance.

Symbol	Import
s_2	The individual's self-cognition as the result of an internal self-confrontation (in a psychodynamic sense) mediated through many internal processes.
s_3	1. The individual's self-cognition as a result of externally mediated self-confrontation by means of CCTV/VR techniques. 2. The individual's self-cognition as the result of stipulated models of behavior. 3. The individual's microenvironment e.g. conditions in microsettings: The individual's own behavior, the behavior of others, experience of subjects, methods, technical means, time limits etc. under experimental conditions.
s_4	The individual's performance as a result of a two-stage production process. First there is a production of structural change in the individual's images and/or systems of value and belief. This change in the individual is not a choice but an event, since the individual's senses (e.g. sight, hearing) are involved. Secondly, there is a choice of actions as a result of the change in the individual's own (structural) properties and the structural properties of performance required, e.g. the properties of his purposeful state.

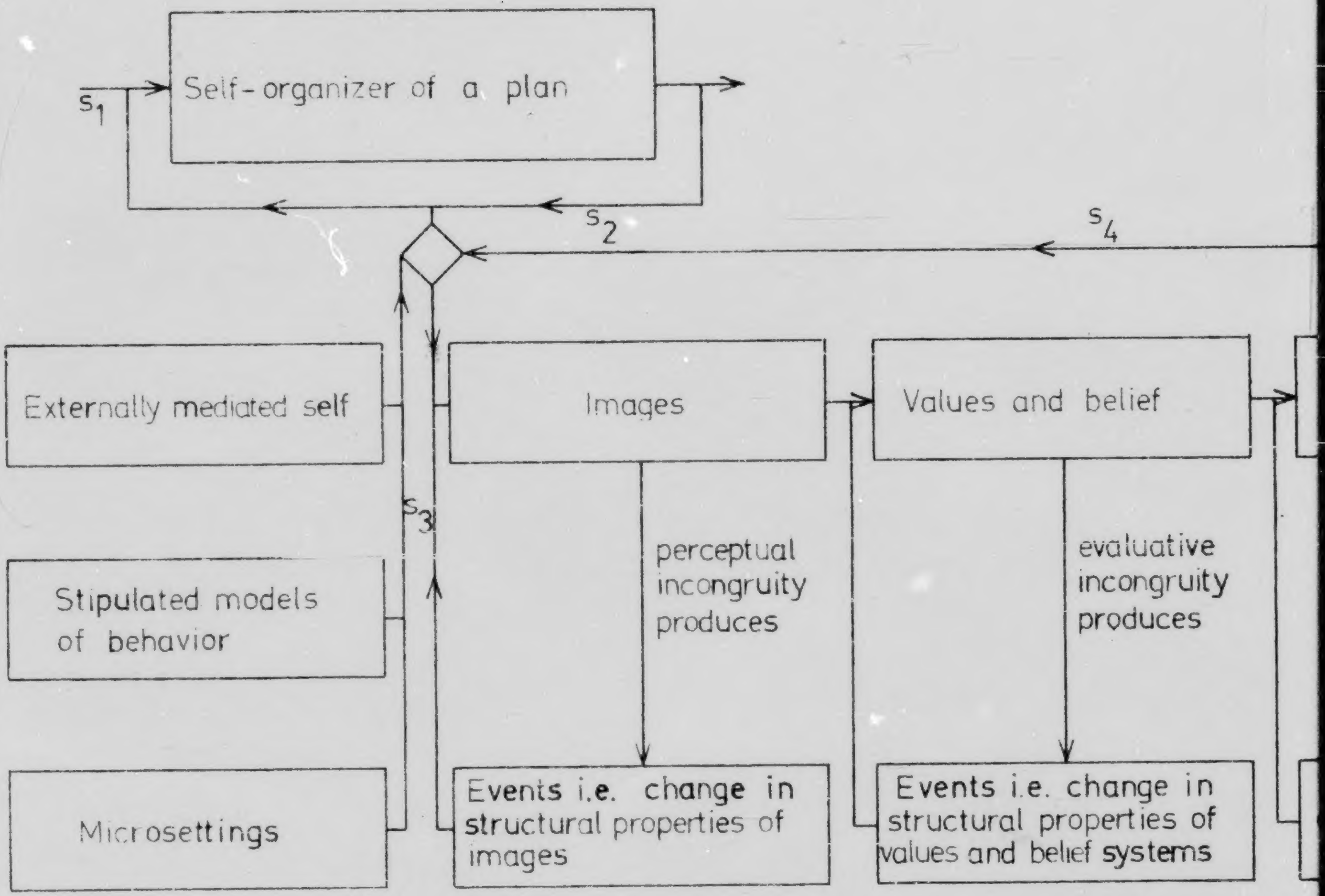
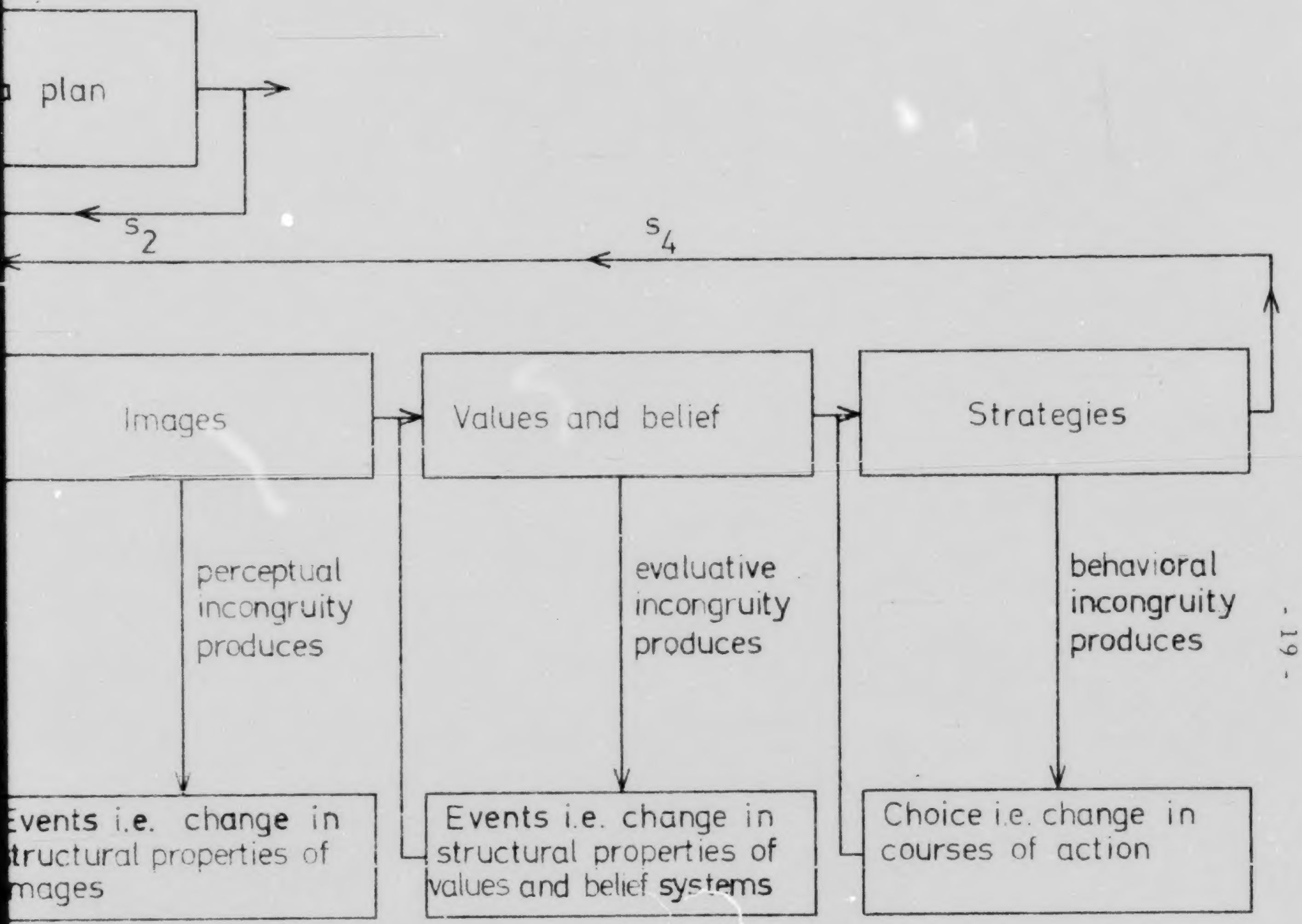

s_1
Self-organizer of a plan
s_2
s_4
Externally mediated self
Images
Values and belief
s_3
perceptual incongruity produces
evaluative incongruity produces
Stipulated models of behavior
Microsettings
Events i.e. change in structural properties of images
Events i.e. change in structural properties of values and belief systems

Figure 1. A cybernetic paradigm for a systematic exploration of an individual's self as steerin
purposeful behavior


plan
s2
s4
Images
Values and belief
Strategies
perceptual incongruity produces
evaluative incongruity produces
behavioral incongruity produces
Events i.e. change in tructural properties of mages
Events i.e. change in structural properties of values and belief systems
Choice i.e. change in courses of action

gm for a systematic exploration of an individual's self as steering and control unit of

4. SELF AS GOVERNOR OF A PURPOSEFUL INDIVIDUAL AND ORGANIZER OF A PLAN

In the psychological discussion, the interest in the concept self is as changeable as the latest "haute couture" fashions (Pepitone, 1968, p. 347). In the classic discussion, the concept of self has above all been of theoretical and metaphysical interest, while the current discussion is based on empirical arguments. The research reported in the literature on one´s own behavior observed by means of CCTV/VR or film uses a number of concepts, such as "self-image", "self-perception" or "self-confrontation". That which binds together all these studies of different aspects of individuals´ personalities is the word self. The second part of the concepts state, however, the method of procedure chosen for the research.

There appears to be a silent agreement between "self-concept" researchers to use self-descriptions as a direct measurement of the individual´s self-cognition. The reason seems to be that they consider that the person who knows most about an individual´s feelings and attitudes is the individual himself. Teacher training is based to a very high degree on just such elements that demand of the individual trainee that he discovers the factors in the teaching process that to a large extent are dependent upon his personality. It would appear to be very essential for teacher training to help the teacher to examine and explore the personal relevance of the school subjects, people, goals, learning methods and patterns of action. Taking such a view, the teaching becomes strongly related to the personality, since it becomes involved with the student teacher´s way of experiencing himself and the experiences he has continually.

4.1 Externally mediated self-confrontation via CCTV/VR

By "self-confrontation" is meant a confrontation with one´s own behavior. The process implies that the individual´s personality is in an active way involved in a de-automatization (Gill & Brenman, 1959) of the usual way of interpreting oneself. The result is a redirection of attention on to such processes where attention had no longer been necessary, since the functions had become automatic.

CCTV/VR is a technique for mediating audio-visual information. Externally mediated self-confrontation via CCTV/VR differs from a simultaneous self-mirroring in the following ways:

1. The individual no longer has the chance of successively editing the incoming audio-visual information.
2. An external confrontation with sound and videorecorded information creates for the individual an entirely new context for perception and evaluation of audio-visual information.

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1. The individual no longer has the chance of successively editing the incoming audio-visual information.
2. An external confrontation with sound and videorecorded information creates for the individual an entirely new context for perception and evaluation of audio-visual information.
3. Analysis of sound and videotapes makes it possible to transfer the past to the present, which is a completely new experience and which must also in some way influence the individual's experiences.

When student teachers, for example, now can achieve an external perception of their own teaching, they become their own "external observers and commentators". This observation technique supplies the research on the process of interaction in teaching situations with an element that is new in principle, namely an "external self-distancing" in space and time. This distancing means an objective definition of a distance in space and time from a condition or a phenomenon. The external self-differentiation, i.e. a distinct demarcation from the actual teaching process, contributes a new form of self-diagnosis and self-evaluation compared to e.g. Cooley's (1968, pp. 87-91) "looking-glass-me". Thus the individual is a part of the original process of interaction, within which he performs many different courses of action, which then in the student teacher's role as external observer and commentator are made the object of perception and evaluation, mediated by CCTV/VR.

It is generally accepted that external observers can maintain greater objectivity in describing a particular person's behavior. But important information is perhaps missed then. The training of student teachers seems to be based on an assumption accepted by almost all teacher trainers: the actions of the teacher or the student teacher depend upon what they believe to be important. What is important, however, is determined by the individual's frame of reference. But how much do we know really, on more objective grounds, about the student teacher's way of regarding himself and his own patterns of behavior in a teaching situation?

4.2 Externally mediated self-confrontation as investigation variable

The goals of education and counseling are to influence individuals in order to bring about modifications of patterns of behavior. One of the prerequisites for such modifications is, from a phenomenological point of view that education and counseling results for the individual in a change in the perceptual field. The individual's interpretation of himself and his environment (image) can be changed by means of information that is meaningful for the individual. The cybernetic model presented in Figure 1 is intended to illustrate both a theoretical vacuum between cognition and action, and the problems that are associated with describing how actions are controlled by a purposeful individual's internal representation of himself and his environment, together with the way in which the individual's predispositions (images and value systems) guide the shape taken by patterns of behavior and courses of action. Miller (1970, p. 2) writes:

> "Unless you can use your Image to do something, you are like a man who collects maps but never makes a trip. It seemed to us that a Plan is needed in order to exploit the Image".

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There is a wealth of emotional statements in the research reports in which CCTV/VR is used to study externally mediated self-confrontation processes, but as far as I know, no studies exist in which it has been possible to demonstrate on objective grounds unequivocal measurable relations between self-confrontation mediated via audio-visual aids and personality changes. Nor has it proved possible to demonstrate how changes in a purposeful individual´s perception and evaluation structure are connected with possible changes in patterns of behavior or choices of courses of action.

Thus before externally mediated self-confrontation techniques can be tested more thoroughly, the confrontation method should be designed on the basis of a number of strictly controlled experiments. Taking the results of this basic research as a starting-point, one would then be able to experiment more freely with the multi-dimensional self-confrontation variable.

The introduction into training of new media and new experimental techniques, such as microsetting models, also makes it necessary at the same time for our efforts to follow up the introduction by means of systematic studies to be intensified. Well-grounded knowledge and extensive training are needed for the rational application of the new technology so that it can lead to improved training and counseling. Therefore it is a question of developing the ability of the individual to perceive and evaluate his efficiency in realizing his intentions, which are made concrete in the form of plans and behavioral strategies. The linking of microteaching and microcounseling with both CCTV/VR and training programs, in which the person being trained explores and applies together with the tutor (supervisor, counselor) principles and theories of behavioral science, should in all probability lead to

1. a self-improvement and consequent improved teaching
2. the trainees discovering the utility of behavioral theories for the interpretation of behavioral patterns in educational contexts
3. hopefully, an intensified integration of theory and practice.

The role of the individual as his own "external observer-commentator" can regenerate our views on education, upbringing and counseling. What we need to study is the ways in which we can use the individual "self" as a controlling and regulating mechanism for the purpose of training people who continually make use of feedback techniques to try out, test and modify their view of themselves and their environment, as well as to modify their own behavior.

Being able to see and judge one´s own behavior in videorecorded situations has proved to be one of the most important factors in connection with training programs and therapeutic treatment. But the question of why self-confrontation via CCTV/VR is so important for behavioral changes and which behaviors are influenced most remains to be studied systematically and under laboratory conditions (cf. Ivey, 1971, p. 126).

In order to clarify whether and in that case to what extent the research done so far on the techniques of audio-visual self-confrontation has contributed to a deeper understanding of the multidimensional variable "externally mediated self-confrontation" in connection with microsettings, the examination of the research literature has been systematized on the basis of the model shown in Figure 1. This basic approach leads to a categorization of research reports as shown in Box 1. On the vertical side are given the independent variables (self, stipulated models) and on the horizontal side the dependent variables.

Box 1. Main conditions for feedback and control of perceptual, evaluative and behavioral changes as a result of externally mediated self-confrontation processes

	Perception	Evaluation	Behavior
Externally mediated self-image	Change in structural properties of an individual´s images	Change in structural properties of an individual´s systems of values and beliefs	Change of a course of action or strategy
Stipulated models of behavior			

Self-confrontation via CCTV/VR has become a popular technique during recent years and has given rise to a large number of reports and articles of very diverse quality. Investigations have often been made with inadequate designs and in addition a large number of reports come from clinical psychological work, which means that the results presented cannot immediately be generalized to educational contexts. Many of the studies that have been examined in connection with an experiment (Bierschenk, 1972 a) unfortunately reveal a whole series of experimental errors, such as the absence of a basic group (the group without influence), deficiencies in the selection of experimental subjects or unsuitable and/or inadequate measuring instruments. The measuring instruments used have in fact usually been designed for purposes other than the study in question. The results are often contradictory and should therefore be regarded as subjective information (which can nevertheless provide certain pointers for future research).

5. PERSONAL CHANGE THROUGH EXTERNALLY MEDIATED SELF-CONFRONTATION

The most prominent aspect of the process of externally mediated self-confrontation is that the individual's interaction behaviors are video-recorded. This type of external mediation provides a unique opportunity of seeing one's self dealing with one or more persons. Thus the person in question is given the chance of being a witness to how he, perhaps, makes excuses for himself, paints a special picture of himself, listens absent-mindedly, is high browed or excessively submissive, appears aggressive or uncontrolled. Only under such circumstances does the individual have the opportunity of seeing himself in the same way as presumably others see him. Taking the word "self-confrontation" literally, the individual comes face to face with or stands in front of the quality of his own personality. He can bring close together facts and information about his own character for comparison or examination.

A study of interaction processes under experimental conditions has shown that a videorecorded self-confrontation is a most important factor for the individual's self-improvement and for the development of desirable patterns of behavior (cf. e.g. Braucht, 1970, p. 99). Usually, however, an interaction process that involves two or more people contains a bewildering abundance of "cues". The problem in all kinds of behavioral training, educational or in psychotherapy, is to sustain the attention of the individual long enough for him to "read" these cues. For the first time, microsetting models for teaching and counseling offer an experimental model that is practicable and that in combination with CCTV/VR should be able to give us the possibility of reducing the number of cues that surround the individual. Microsettings together with CCTV/VR could form a genuine "practice site" where cues can be facetted or eliminated and where the individual can under relatively safe conditions learn to meet situations that can gradually increase in complexity. The basic hypothesis is that the observer's self-perception, evaluation and predisposition can lead to idiosyncratic strategies for information-seeking and action.

Salmon & Ramseger (1970, pp. 92-95) carried out a microteaching experiment on this problem. The question put in the experiment was: What effects do the playback of the student teachers' own videotape only, the playback of their pupils' videotape only and the combined playback of both the student teachers' own and their pupils' videotape or tutoring have on the evaluative ability of student teachers? The result of this investigation was that the three different video-variations had no differentiating effect. Even when each video feedback group mean was compared with the tutoring group mean, no variation of importance could be shown. This result has the imconfrontation is that the individual's interaction behaviors are videorecorded. This type of external mediation provides a unique opportunity of seeing one's self dealing with one or more persons. Thus the person in question is given the chance of being a witness to how he, perhaps, makes excuses for himself, paints a special picture of himself, listens absentmindedly, is high browed or excessively submissive, appears aggressive or uncontrolled. Only under such circumstances does the individual have the opportunity of seeing himself in the same way as presumably others see him. Taking the word "self-confrontation" literally, the individual comes face to face with or stands in front of the quality of his own personality. He can bring close together facts and information about his own character for comparison or examination.

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The individual's self-concept is based on a multitude of experiences in concrete, often dyadic situations, which have gradually become structured, generalized and stored in perception and evaluation structures. These structures need not be in agreement, however, with how other people react to the individual in question, since the way in which the individual is seen by others is largely determined by his functional behavior. Awareness of i.e. one's own communication behavior is, however, usually very slight, if not non-existent. It can, therefore, be difficult to estimate the effect of this behavior on other people. It is also difficult to ask other people how they react to oneself. Defence mechanisms and the guiding (self-control) of one's own behavior often make it more difficult to maintain control over a particular given situation.

The way in which other people react to one appears to be a relatively stable phenomenon. Even though in the meantime a change takes place in the individual's need of interpersonal patterns of contact, the picture that others have formed seems to be relatively unchanged.

Many of the individual's behaviors depend on the individual's anticipated reception by others. For many people this leads to a vicious circle, in which case a technique such as self-confrontation via CCTV/VR makes it possible to objectivize this component in the interaction process and this is a factor of particular value. It could lead to a reduction of the differences in the information that is de facto passed in the interaction between different people and the information that the individual would have liked to give.

A study of the interaction processes in which CCTV/VR has been used has shown that a confrontation with one's own videorecorded behavior during psychotherapeutic treatment gives guidance in the development of a more realistic perception of one's own person, which results in changes in the individual's reaction to other people (Onder, 1970, p. 23).

Wylie (1961, p. 246) and later Steiner & Rogers (1963, pp. 128-136) pointed out that the main motive for looking at oneself and selecting new information about one's own behavior lies in the effort to increase or at least retain self-esteem. Wolf (1943) and Nielson (1962) report extreme emotionality and rejection, plus avoidance of the information that the person received by seeing himself on film. One of the first experiments in this area was carried out by Cornelison & Arsenian (1960). They used both still pictures and film for the confrontation. The reaction pattern varied greatly. Both "psychic shock" and favorable changes in persons undergoing psychotherapeutic treatment were reported. Kagan, Krathwohl & Miller (1963, pp. 237-243) developed in connection with the CCTV/VR technique a technique that is called "Interpersonal process recall" (IPR). This technique gives the participants in a dyadic confrontation, increased opportunities immediately after the confrontation to recall past images and to recall experiences from the dyadic confrontation. The technique is regarded by the writers as a "major breakthrough in psychiatric methodology".

Stoller (1967) used the CCTV/VR technique in a psychotherapeutic treatment of groups of patients. It is a known fact that long hospitalization often leads to apathy, i.e. considerable reduction in reactions. Stoller reported progress in the form of an increased number of reactions from patients who had been at the hospital for more than 10 years.

Walz & Johnston (1963) investigated the effect which externally mediated self-confrontation has on self-perception in trainee counselors. The study showed that, after having seen themselves, the subjects in the experiment could more easily accept other people's assessments of their professional skills and that they became less positive in self-evaluation. The study also showed that videorecording offers a unique instrument for helping students during their practice period to understand themselves better and to be more aware of the feelings of the patients. Kagan et al (1963) also used CCTV/VR feedback in order to help counselors learn interview techniques. The test result in this case noted that trainee counselors feel sufficiently removed from the image of themselves on the television screen to be able to see the "subject" on the TV monitor screen objectively.

Abbott (1965) investigated the relations during treatment between therapist and patient by recording the patient's behavior in a treatment situation. The purpose of this study was to investigate the effects on the behavior of the patients when they were confronted with their own behavior. The author's conclusions that can be based on controlled results are that the self-confrontation resulted at first in a decrease in the responsibility shown by the patient for the treatment process. The self-confrontation did not, however, stop the patient from taking responsibility at the end of the experiment. Confrontation with one's own behavior resulted in an increased interest in one's person and in increased motivation in the individual for understanding his own Ego (Abbott, 1965, p. 111).

Stroller (1967) found that schizophrenic subjects started after a period of self-confrontation with their physical appearance to observe their own undesirable behaviors and tried to change them.

Kaul, Kaul & Bednar (1973, pp. 132-136) investigated counselor confrontation and depth of client self-exploration. The hypothesis in this study was that if confrontation leads to a general increase in client self-exploration, counselors with a "confrontive" style should induce greater ces from the dyadic confrontation. The technique is regarded by the writers as a "major breakthrough in psychiatric methodology".

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Braucht (1970, pp. 95-101) studied the effects that immediate self-confrontation has on patients´ self-concept. The hypothesis in this study was that patients who lose in self-esteem in reality improve their self-description, i.e. they become less defensive and achieve a more realistic self-concept. The use of this reality concept led to unequivocal and consistent results that show (1) that self-confrontation was of great importance for an improvement in the patients´ accuracy of self-description and (2) that patients with grave or chronic psychiatric disturbances gained most from the self-confrontation. The hypothesis that patients feel threatened by this process that has been put forward in many contexts cannot be said to have received any confirmation from this investigation.

Davis (1972, pp. 191-192) describes the use of externally mediated self-confrontation in group-therapeutic contexts. The treatment concerned a group of 24 alcoholics. This group was divided into two, so that 12 patients were treated with self-confrontation and group therapy while the other 12 were treated with individual counseling, without self-confrontation. Of the first 12, only 4 did not manage to complete the program and 5 of them could reduce their consumption of alcohol. In the second group 9 patients did not complete the program and 2 reduced their consumption of alcohol.

Berger (1973, pp. 304-306) presents a new method of approach by using what he calls "Multi-image immediate impact video self-confrontation". Via a CCTV/VR technique the patient is presented with a multi-self-image. Some images have by technical means been "distorted" to a greater or lesser degree. These distorted images are shown simultaneously with a non-distorted image, what is called a "clear image". The purpose of this projective method of confrontation is to elicit free associations with past or present self-concepts and "introjections". These associations are meant to lead subsequently to manifest insights and to map the patient´s self as it is experienced in the present. Berger (1973, p. 305) writes:

> "The multi-image experience served as a marker or milestone in the way it became imprinted and patients referred back to it at impredictable moments".

Studies in which specific standards are neither given nor accepted have also been carried out in educational contexts. The objective of all kinds of education is to achieve behavioral modifications. It is the individual´s image of himself and his environment that must be subjected to a process of change, since the individual´s knowledge of himself and the world around him is represented in the image. Thus the behavior of the individual depends on his image of the universe. The individual´s image can be changed by means of the transmission of information that is meaningful for the individual and this in its turn is the basic prerequisite for changes in attitude and behavior.

Kerber (1967) tried to determine the extent and the demonstrable effects that confrontation with one´s own behavior in teaching situations has on the student teachers´ way of developing a "personal-professional concept". The measuring instrument used is "Cantril´s Self-Anchoring Scale". The study (Kerber, 1967, pp. 106-108) showed three forms of change:

1. a change from an idealistic to a more realistic way of regarding the teaching
2. a reinforcement of the feeling of being a beginner and increased awareness of the difficulties that are involved in becoming an "ideal teacher"
3. a more critical and more analytical attitude than was shown by the student teachers before they saw themselves.

All the subjects in the experiment considered that a continuous self-evaluation is necessary to achieve a change from being a beginner to being a successful teacher and that there is always a need to analyse one´s own teaching.

Pepperman (1967) investigated the effect that videorecording has in "counselor training" on the trainees´ self-evaluation without the mediating influence of a tutor. Pepperman´s (1967, p. 75) results showed among other things that the patients who were treated by trainees who were trained in the usual way assessed these trainees more positively than the patients who were treated by the group of trainees who were able to see themselves via the CCTV/VR technique. The trainees´ self-assessment at the end of the experiment did not show any appreciable difference between the two groups. The group that could see itself showed during the experiment a noticeable improvement in the objectivity of their self-assessment, while the group that was trained in the usual way from start to finish did not show any change in self-assessment. An analysis of special patterns of behavior showed behavioral modifications. The group that saw themselves via CCTV/VR showed an appreciable improvement in "positive communication behaviors".

Dieker, Crane & Brown (1968) conducted an investigation in order to study the significance of repeated self-confrontation via CCTV/VR on students´ self-concept. The hypothesis in this study was that self-confrontation leads to the students´ (in a speech course) evolving an actual self depends on his image of the universe. The individual's image can be changed by means of the transmission of information that is meaningful for the individual and this in its turn is the basic prerequisite for changes in attitude and behavior.

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Salomon & McDonald (1969) investigated information selection and attitude changes in in-service teacher trainees who for the first time saw themselves in a teaching situation. The investigation showed that self-observation leads to attitude changes that are related to the subjects´ predispositions. Salomon & McDonald (1969, p. 14) establish that when there is no model for "good teaching", no tutoring and no new and general norms are accepted, the reaction to seeing oneself and one´s own performance in the teaching situation is largely decided by the subjects´ predispositions. This means that the subjects´ satisfaction with their performance prior to seeing the recording will decide what is observed on a TV monitor, in what way it is evaluated and to which attitude and behavioral changes it will lead. Unfortunately the writers did not use a control group design, e.g. a group that was given tutoring in connection with seeing themselves.

Berman, Shulman & Marwit (1973) studied this problem among others, in the framework of a carefully planned experiment. In the investigation the assessment of audio videotapes of the behavior of subjects by 96 assessors (48 males, 48 females) was studied. The experiment (Berman, Shulman & Marwit, 1973, p. 6) shows that the subjects´ perception of self covariates to a high degree with the subjects´ expectations of their own behavior (honest, apprehensive, sceptical). A generalization of these results means that people will probably say that they have behaved in a certain way (e.g. relaxed) despite the fact that the behavioral evidence is to the contrary.

Boone & Goldberg´s (1969) experiment showed a general trend in the subjects´ reactions that indicates that the subjects appear to be less inclined to assess themselves as "less good" after the first experience of externally mediated self-confrontation than is the case on later confrontation occasions (although fluctuations occur). The authors observed (p. 23) that subjects with low self-evaluation more often make use of negative reinforcement than subjects with high self-evaluation. In addition the study showed that the subjects´ positive reinforcement techniques were more stable and resistant to change than negative reinforcement techniques. The main result in this experiment was that subjects with high self-evaluation did not change their self-perception as a result of externally mediated self-confrontation.

Roberts (1972) states that many "normal" people with low self-evaluation have difficulty in establishing effective communication and that supports the conclusion drawn by Kerber (1967).

Salomon & McDonald (1969) investigated information selection and attitude changes in in-service teacher trainees who for the first time saw themselves in a teaching situation. The investigation showed that self-observation leads to attitude changes that are related to the subjects´ predispositions. Salomon & McDonald (1969, p. 14) establish that when there is no model for "good teaching", no tutoring and no new and general norms are accepted, the reaction to seeing oneself and one´s own performance in the teaching situation is largely decided by the subjects´ predispositions. This means that the subjects´ satisfaction with their performance prior to seeing the recording will decide what is observed on a TV monitor, in what way it is evaluated and to which attitude and behavioral changes it will lead. Unfortunately the writers did not use a control group design, e.g. a group that was given tutoring in connection with seeing themselves.

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Roberts (1972) states that many "normal" people with low self-evaluation have difficulty in establishing effective communication and that there is every reason to suppose that the relation between an individual´s self-image and self-evaluation is more than an artificial relation. For the individual the basic problem of fulfilling the demand for self-knowledge, "know thyself" and "unto thyself be true", stems from difficulty in developing the skill (based on the individual´s interaction with other people) of being able to see oneself as others see, hear or react to the person in question.

Self-exploration and self-evaluation are two basic concepts, which have been used in a comprehensive self-confrontation experiment (Bierschenk, 1972 b), in which the experimental factors are fixed and manipulative and the design fully crossed and completely balanced. The experiment used audio-videotapes of microlessons in order to study, among other things, student teachers´ perception, and evaluation plus self-improvement. The self-confrontation experiment consists of an attempt to modify the student teachers´ perception and evaluation by means of self-confrontation mediated by videotapes and traditional tutoring.

The main results have been described in Bierschenk (1972 b), but in this context it can be of interest to mention that neither traditional tutoring nor externally mediated self-confrontation via CCTV/VR influenced the student teachers´ perception or evaluation appreciably, possibly because the period of influence during the experiment has been too short for the different experimental conditions to be able to bring about observable effects. However, this result confirms the findings of Waimon & Ramseyer (1970). A detailed study of the experiment´s design, analysis techniques, results, implications and recommendations for continued research is to be found in Bierschenk (1972 b).

A continued evaluation of the experiment´s follow-up studies has led to results that ought to be of great importance when it comes to mapping the individual´s perception and evaluation structure. The experiment´s level analyses show that neither the perception nor the evaluation of the student teachers changes appreciably during the entire period of training (3 years, the interval between the experiment and the follow-up was two years). Structure analyses of both student teachers´ perception and evaluation and educational experts´ perception and evaluation of teaching processes showed at the end of the training at the School of Education that there is a demonstrable common structure in the perception of the student teachers and the educational experts, but that there is no demonstrable common structure in their evaluation. In addition, the experimental results show that the evaluation structures of the student teachers and the educational experts have no demonstrable connection, either at the beginning or at the end of the training period. To some extent, these results are loping the skill (based on the individual´s interaction with other people) of being able to see oneself as others see, hear or react to the person in question.

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These findings of independent research (Bierschenk, 1973 b; Bergman et al, 1973) are of great importance for the continuing experimental research. For if we do not succeed in creating common evaluation structures or at least establish on which points they differ, there can hardly be any prospects of achieving behavioral modifications as a result of teaching programs. Not until the trainees reassess their own behavior, can there be a readiness for building up new "desirable" patterns of behavior. Judging from the results of the experiments, one can assume that self-confrontation does not immediately lead to changes in the trainees' perception and evaluation structure, but taking a longer view, changes do occur. In addition self-confrontation should need systematic training if the individual is to be able to make use of such non-verbal "self"-information. In the studies in which externally mediated self-confrontation via CCTV/VR has been used, the subjects are reported to have become deeply involved in this kind of self-confrontation. Allen & Ryan (1969, p. 55) have observed a general uncertainty in their subjects concerning their first teaching performance and recommend that during this first critical period the student teachers should be given so many videotape recordings that they can achieve congruence between their internal and external conceptions (self-image and TV image) before any more systematic influence via e.g. a tutor is started. The writers say nothing, however, about when this period of "uncertainty" can be expected to pass or how many times an individual student teacher should see his lesson(s).

Bierschenk (1973 a) found within the self-evaluation dimension that the student teachers' self-evaluations on the first confrontation occasion (when the teaching occasion is held constant) is more positive than on the study of Berman et al (1973). The writers found that the subjects' perception (in the evaluative sense of the word) of their own behavior (honest, apprehensive, sceptical) is not significantly correlated with judge ratings of the subjects' behavior. The writers' study of the subjects' "perception" of the experimenter's behavior (professional, warm, active) points in the same direction, i.e. the subjects' "perception" of the experimenter's behavior is not significantly correlated with the subjects' expectations concerning the experimenter's behavior. But the subjects' perception of the experimenter's behavior is significantly correlated with the judges' ratings of the experimenter's behavior (warm and active). In this case the subjects simply form another group of judges.

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Bierschenk (1973 a) found within the self-evaluation dimension that the student teachers' self-evaluations on the first confrontation occasion (when the teaching occasion is held constant) is more positive than on the second and third play back of the experiment´s videorecorded material. This result implies that the student teachers need several play backs (between 3 and 6) of the same situation if they are really to be able to make evaluative changes themselves. In addition these results do not verify earlier research results (Dieker, Crane & Brown, 1968, p. 5; Boone & Goldberg, 1969, p. 18) that subjects feel their performance in the first externally mediated self-confrontation via CCTV/VR to be "less good", that they become deeply involved in this type of self-confrontation and that they react with extreme emotionality. Nor does the student teachers´ satisfaction with their own achievements appear to decide what is observed on the TV monitor and the way in which it is evaluated, since repeated confrontations with the same microlesson lead to demonstrable differences in the reassessments.

The individual´s way of focussing on the physical aspects of his own person, for which Allen & Ryan (1969, p. 55) have coined the term "cosmetic effect" is, according to the authors, of relatively short duration but this stage is also described as being very delicate. But Claus (1968) goes one step further by giving "cosmetic effects" as a possible reason for the subjects´ not making effective use of cues, when training "higher order questioning". Her idea is that the subjects are preoccupied by their physical aspects, which hinders a rational treatment of the videorecordings and that therefore the cues remain without effect. In externally mediated self-confrontation via CCTV/VR, a situation exists in which de-automatization occurs. Our results (Bierschenk, 1973 a) show that repeated confrontations with identical videotaped microlessons influence the individual´s identification experience in different ways. While three repeated playbacks of a microlesson only led to slight changes towards an increased recognition, it was not until the fifth playback that the student teachers to a demonstrably greater extent experience their behavior as being as they expected. At the sixth viewing, however, a new de-automatization occurs of the "automatized" self-image, in that the behavior is once again experienced as being more unexpected. Here the confrontation experiences that are in another context (Bierschenk, 1972 a, pp. 22-29) described as a de-automatizing process of the usual way of experiencing oneself seem to have led to a redirection of the attention to such processes for which it had no longer been necessary, since the functions had become automatic. Thus it seems as if, temporarily at least, a disorganization of the functions has occurred which is a prerequisite if new functions are to be built up.

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Some kind of reassurance from a tutor leads, however, to the student teacher retaining his impressions from the first viewing. It is difficult to say whether or not this effect is desirable, since the tutor's reassurance could very well be seen as a reinforcement of the student teacher´s defensive position prior to his experience of self-confrontation and thus nullify the effect of repeated confrontations with his own video-recorded microlessons. This interpretation is supported by the results obtained by Kerber (1967) and Dicker, Crane & Brown (1968). The results of Watts (1973, p. 214) also confirm that the tutor helps to maintain the student teacher´s image of himself. Watts finds that the hypothesis in his experiment is confirmed by the results of the experiment, namely "that subjects´ undervaluing of both cognitive and physical performance tends to be greater where a critic is not available to provide and reinforce a model of the approximate behavior". The author´s conclusions, which are based on this study, should however be regarded with some reservations, since the design applied does not permit any control of instructor x method interactions.

Thus the tutor appears to sustain the student teachers´ usual way of looking at themselves, which in its turn does not permit any change in a relative autonomy, i.e. freedom from the influence of authorities.

Tutors (supervisors, advisors, critics etc.) provide the context for self-evaluation in teacher training and reinforce in this way a model against which performance has to be judged by the student teachers. It has been demonstrated that the presentation of models is of significance for learning and training. Among the studies of which specific standards or models of behavior are given or accepted by the individual, some of the most important are those which have been carried out at Stanford University Center for Research and Development in Teaching, by the US Air Force and at the Far West Laboratory for Educational Research and Development. This type of investigations is reported in Chapter 5.

To summarize. A large number of investigations have been studied, of which those described above are a selection intended to represent the results that are significant for further research on the self-confrontation variable in connection with personal change. An attempt to find guidelines for continued research work and a pattern in the educational and psychological implications that have been presented in connection with the individual empirical results has led to the following main conclusions with regard to:

Perception

1. Increased objectivity in the individual´s self-perception, in the sense of intersubjectivity
2. Increased realism through the adjustment of the individual´s self-perception

3. Greater breadth of association and increased opportunities for the remembrance and retrieval of past images through the "Multi-image immediate impact video self-confrontation"

4. Predisposition has a controlling influence on the individual's self-perception

5. Expectations covariate to a considerable extent with self-perception

6. Individuals with high self-esteem are to a lesser degree influenced in their self-perception by externally mediated self-confrontation than individuals with low self-esteem

7. The use of externally mediated self-confrontation necessitates help in conceptualization, which means a systematic training if the individual is to be able to use first-hand information

8. De-automatization of one's way of seeing one's self requires a number (about 6) of repeated playbacks of identical situations before de-automatization processes occur.

Evaluation

1. Videovariations (e.g. teacher, pupil, teacher & pupil) are as effective as tutoring with regard to the student teachers' evaluative ability in assessing their own teaching

2. Trainee counselors find it easier to accept other peoples' judgments of their own skills

3. Externally mediated self-confrontation leads to less positive self-evaluation

4. Self-evaluation differs to a considerable degree and in a consistent way from the evaluation by judges

5. When judging a third person (e.g. the experimenter) both subjects and judges have a noticeable degree of agreement in their evaluation of this person

6. Patients' self-concept becomes more realistic through the use of externally mediated self-confrontation

7. Externally mediated self-confrontation leads to a more critical analysis of one's own behavior

8. Student teachers show a change from an idealistic to a more realistic way of looking at their teaching

9. Evaluation of one's own behavior changes in accordance with the number of videotape playbacks. The change function shows plateaux

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8. Student teachers show a change from an idealistic to a more realistic way of looking at their teaching
9. Evaluation of one´s own behavior changes in accordance with the number of videotape playbacks. The change function shows plateaux and leaps

10. Low self-esteem leads to negative reinforcement, while high self-esteem leads to positive reinforcement of pupils
11. Repeated viewings of identical situations lead to demonstrable differences in reassessment.

Contradictory results and varying interpretations have been reported concerning the individual's reactions to self-confrontation experiences. Depending on the population involved in the study, different developments in the individual's self-evaluation are reported. In psychotherapeutic contexts, an initial negative self-evaluation that gradually becomes positive has been observed. The use of externally mediated self-confrontation in educational contexts shows, on the other hand, that the self-evaluation of the student teachers is usually positive in the beginning but gradually becomes more negative.

Behavior

1. Externally mediated self-confrontation facilitates counselors' self-understanding
2. Patients who have been confronted with their own videorecorded behavior show an increased feeling of responsibility
3. Externally mediated self-confrontation increases the motivation for understanding the actions of oneself and others
4. In patients who have been confronted with their own behavior, an increased tendency is seen for their undesirable behaviors to change towards such that are more "desirable"
5. Alcoholics who have participated in group therapy and who have been confronted with their own behavior seems to reduce their alcohol consumption
6. Externally mediated self-confrontation increases insight into oneself and the world around one
7. Externally mediated self-confrontation leads to more positive communication behaviors than are seen in people who have not been confronted with their own videotaped behavior

From this summary there arise three main problems, which future research on externally mediated self-confrontation via CCTV/VR and its uses should tackle:

1. Clarification of the terminology

   The research on the observation of one's own behavior by means of

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CCTV/VR or film that is reported in the literature uses a multitude of different concepts, such as: self-actualization, self-differentiation, self-consistency, self-acceptance or self-esteem, self-evaluation and self-cognition or self-image, self-perception and self-confrontation.

The different concepts can, of course, be used in different contexts, but the conclusion drawn by Wylie (1961, p. 317) remains:

> "We have noted that the empirical researchers on constructs concerning the self cannot be classified according to theoretically relevant categories because the theories are vague, imcomplete and overlapping; and because no one theory has received extensive empirical exploration."

What is needed is a systematic research plan within the phenomenological personality theories for the establishment of fruitful behavioral theories. The empirical research shows that researchers have so far not attempted to investigate the variable "externally mediated self-confrontation" in a systematic manner. In order to systematize the research results somewhat, the studies have been examined on the basis of Box 1. The basic hypothesis for this examination is that an individual's perception and evaluation will decide the extent to which the individual has control over the situation in which he finds himself. The subject's sense of control over a situation is in its turn dependent on the individual opportunities for choosing alternative strategies of action. Thus the choice variable is of fundamental importance for a study of self-perception and evaluation. It is assumed that this variable has far-reaching consequences with regard to its effects on behavior. The experience of many possible choices probably leads to greater tolerance in situations that are for the individual critical or unpleasant.

2. Legal conditions and security

Considering the ever-growing amount of research data that consists of videorecorded behaviors of subjects or clients, it will become necessary to take safety measures to protect the individual's right to privacy and guarantee security. This is assuming that recording per se is not an infringement of the right to privacy, while the video playback of tapes to persons not originally present could be so construed.

The range and ambiguity of this question suggest that the experimenter or counselor will have to determine for himself his legal vulnerability. It is therefore recommended that the investigator use a written consent form to obtain informed permission for the playback of videotaped protocol material to persons other than the original perticipants in the interactions which were recorded. (Cf. Geertsma, 1969, pp. 194-195.)

3. The designing of experimental investigations

Controlled experiments within the field of educational and psychological research in connection with the use of the more well-known statistical analysis techniques are a minimum requirement if one wishes to decide between varying opinions about the most adequate application of the technique of externally mediated self-confrontation via CCTV/VR. Even if the deficiencies in design, measurement instruments, statistical analysis and interpretation (over-generalization) have not been explicitly stated for each individual study, it is quite plain in most cases the groups investigated consist of people who happened to be on hand. Only a few investigations make use of the control group design with satisfactory control groups. A stricter analysis than that which could be carried out within the limitations of this study would probably have led to the conclusion that only a few of the studies contain results that permit an interpretation on the basis of the investigation's empirical data and that the great majority are based on speculations, with little empirical foundation.

A greater effort is required in order to achieve a more unequivocal formation of theories. The main explorative research at present should lead to systematically planned series of experiments in order to get the self-confrontation variable under control.

6. STIPULATED MODELS OF BEHAVIOR AND THE PROCESS OF EXTERNALLY MEDIATED SELF-CONFRONTATION

Tutors usually represent the "model" that student teachers try to imitate or be guided by. The tutor's teaching performance appears to be exemplary. The educational system backs up this idea by trying to appoint as tutors in-service teachers who seem to be excellent practioners and who have long professional experience. This "model" can be accomplished by the viewing of models on film or on videotapes, through simulation or through micro-teaching models. In this way special techniques or teaching styles can be demonstrated. Videotaped models differ considerably from normal teaching situations, since attention is focussed on specific teaching behaviors instead of the usual unfocussed classroom observation. The model can be described as an a priori organized situation with the purpose of amplifying a specific teaching behavior and filtering out other, probably distracting, information.

Acheson (1964) investigated the importance of the tutor in relation to externally mediated self-information via CCTV/VR by means of a two-factorial design. The writer comes to the conclusion that videorecording as a feedback method combined with tutoring is a useful instrument for making it easier for student teachers to analyse themselves and change their behavior in a teaching situation. The use of videorecording also brought about a limited improvement in the tutor's possibility of producing behavioral modifications in the student teachers through both direct and indirect tutoring.

Olivero (1964) studied a number of problems with respect to the use of CCTV/VR techniques as a substitute for the student teachers' direct observations of teaching processes. Olivero comes to the conclusion that the students obviously need feedback if they are to be able to achieve behavioral modifications. Verbal feedback through a tutor plus videofeedback had in this study a greater effect than simply verbal feedback through a tutor.

Orme (1966) showed on the other hand that it is more effective (1) to tutor solely with a physical person than (2) to let the student teachers be confronted by videorecorded teaching models or (3) to confront the student teachers with their own videorecorded lessons.

Young (1967) investigated fifteen different aspects that are included in the student teachers' training in methodology. The purpose of this study was to determine the relative effectivity of different tutoring models in the practice of special skills (Stanford Skills). Student teachers functioned as model teachers and were asked to enact concretely these methodological aspects. Lesson models were videorecorded and inter-

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In order to test Stanford's "microteaching" model, a microteaching project was started by Brusling in 1970. The main purpose in the application of this model was to study the relation between teaching process and teaching results. The variable chosen was "cueing", following D. Young's (1967) work on "cueing" as an important modeling variable. A cueing model was compared to "non-cueing". In addition a study was made of the effects that seeing models of the same or opposite sex have on student teachers' evaluation of their own teaching performance. The measurement variables were non-verbal cues (play of features, locomotion, pointing, gestures, head movements, duration of pupils' talk and duration of teacher's talk). This study has still (1974) not been reported. A preliminary report (Brusling, 1973) shows that only within the variable locomotion can any significant difference be established.

The question of how far a tutor in a dyadic confrontation with a student teacher counsels more effectively, i.e. mediates teaching strategies, than it is possible to do via videorecorded behavioral models or via externally mediated confrontation with one's teaching behavior cannot be answered on the basis of the research results so far available. Only more carefully planned studies and the application of better analysis techniques than those used in the studies described above can increase our understanding of the interplay between tutor and student teacher.

Unruh (1967) conducted a method study in order to map the effectiveness of different registration methods with subsequent estimation of teaching situations by a panel of judges. In the study, typed reports sound tape recordings, videotape recordings and a combination of these alternatives were compared. This study also investigated on which registration technique the judges based their "correct" assessments of the teacher's efficiency according to a given efficiency criterion. To summarize it can be said that Unruh finds that the most valid source for the given supporting stimuli, which provide the basis for the judges' estimations, appear to be audio-videorecording of teacher behaviors. All the methods used for the analysis showed that the audio-visual recordings were the best sources for estimating the teacher's effectiveness. One explanation of this is that the audio-visual presentation most closely resembles the ordinary classroom situation.

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Ljung & Naeslund (1968) studied the reliability of an "effectiveness criterion", namely the assessment by educational experts of student teachers´ effectiveness. The assessments were made on the basis of video-recorded acceptance interviews that were carried out in 1967. These videotapes showing interviews with twelve student teachers were assessed by lecturers in methodology and by in-service teachers. The correlation varied for pairs of assessors on an average between .40 and .74. Ljung & Naeslund (1969) carried out a follow-up study in order to investigate the validity of the assessments made on the basis of videotaped interviews of student teachers´ effectiveness after the student teachers had completed a six-month practice period. This practice period took place a year and a half after enrollment. The agreement between the two assessment occasions proved to be on an average between .21 and [illegible]. Thus there is no validity to speak of in the assessment of student teachers´ effectiveness as in-service teachers.

Ahlbrand (1972) used microteaching in the training of trainee secondary school teachers. He concentrated mainly on the relation between the "behavioral style" of the teacher and the motivation and interest in the lessons as revealed in the pupils´ reports. In these laboratories, tutors (graduate assistants with teaching experience in the secondary school) advised the trainees for about 20 hours a week. Assessments were evaluated with great care and the reliability of the assessments was checked. The interjudge agreement between the tutors was checked once a week. The evaluation of the first year showed that there were zero-order correlations between the tutors´ and the pupils´ assessments of the pre-service teachers´ lessons. In a more strictly designed study within a program of influence carried out outside the university, the main hypothesis on the connection between the teacher´s style of teaching and the pupils´ motivation could be verified (r = .81). The author (1972, p. 7) writes:

"... as teacher behavioral cues as perceived by the micro-student increase, so does the micro-students´ reported interest and stimulation in the lesson."

The study indicates that the development of behavioral styles in the student teachers and the way in which the pupils react to these is an important research area that has been little explored.

J. Young (1971) studied the importance of different microteaching variables for the effectiveness of the model. Included in the model as variables were (1) oral evaluation, (2) videotape recordings and (3) peer group, i.e. ninth-grade pupils. The measuring instruments used were Flanders´ verbal interaction category system and a videoteaching evaluation scale. The results of this investigation show that only one variable was of importance for the student teachers´ performance in microclasses, namely the use of ninth-grade pupils. In this experiment it was shown that student teachers felt uncomfortable when faced with the task of teaching ninth-grade pupils.

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Nuthall (1972) conducted an experiment in order to compare two types of pupils (10-year-old pupils and peers acting as pupils). His hypothesis was that there should be no differences between student teachers in the development of teaching skills in a microsetting. The experimental results showed that student teachers who developed their teaching skills in a micro-setting, where peers acted as pupils repeated their "pupils'" answers less than those who practised with genuine pupils.

Wagner (1972) conducted an investigation into how far practical exercises really are necessary, suggesting that it is perhaps cognitive discrimination learning that leads to behavioral change. The main hypothesis of the investigation is that discrimination learning is decisive for the process of behavioral change. Wagner finds that the hypothesis is confirmed and states that discrimination learning appears to be superior to microteaching practice. But in a discrimination test a few weeks later, the differences between the groups proved to be without particular significance, which means that the results must be interpreted with great care. But since this problem is part of the main problem concerning the development of methods for planned change, the investigation can be of interest. Further experiments should be carried out in order to develop methods and techniques for discrimination learning, which is a major problem treated by Claus (1968) and Ward (1970).

Claus (1968) investigated the effects of modelling and feedback techniques on the teacher's development of questioning skills. The main hypothesis is that student teachers, who see cues interfoliated in models recorded on videotape, often put questions of a higher order than student teachers, who see the models without such cues. She comes to the conclusion that modelling with cues is clearly more effective in training teachers to use higher order questions than non-cued modelling treatments. The connection between higher order questions put by the student teachers and the students are, however, almost without exception negative (see Becker, 1971, p. 178).

Ward (1970) studied the use of portable videotape recorders in in-service teacher training. The teachers were to learn to evaluate their own questioning behavior. The type of questions were identified, discussed and studied at Far West Laboratory for Educational Research and Development. Ward comes to the conclusion that there is some evidence that the behavior of in-service teachers can be influenced. However, there is a sparsity of evidence citing the effect of the portable videotape recorder on conducted an experiment in order to compare two types of pupils (10-year-old pupils and peers acting as pupils). His hypothesis was that there should be no differences between student teachers in the development of teaching skills in a microsetting. The experimental results showed that student teachers who developed their teaching skills in a microsetting, where peers acted as pupils repeated their "pupils´" answers less than those who practised with genuine pupils.

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Simulation is another form of instruction. By the use of various forms of media (films, videotapes, role-playing and written material), school and instructional situations can be simulated. Thus, simulation can be defined as an instructional "problem-solving activity" which closely relates to life. With the invention of CCTV/VR, simulation has acquired a new interest for psychologists and educators.

Bjerstedt (1969) constructed a videotaped simulator test. The test consists of teaching situations in which it is essential for the teacher to make a decision. Student teachers are in this test faced with the task of making in a very limited period of time suggestions as to suitable measures. The stimuli given are interaction situations that are broken off just as the teacher is confronted with a social provocation. The student teachers then have to choose between alternative courses of action.

Eisenberg & Delaney (1970, pp. 15-19) studied the use of video-simulation in counseling training for counselors. The purpose of this study was to investigate how a videotape of 40 high school age clients functioned as a simulator of counselor "tacting response lead". The investigation included a presentation of a model, a systematic reinforcement and a combination of the two variables. The most essential result is that modelling procedures influenced the subjects in using a "tacting response lead" to clients on videotape.

Stein & Bryan (1972, pp. 268-273) studied the effect of a videotaped model on the rule adoption behavior of children. Girls from the third and fourth grades viewed a model which verbally encouraged either conformity to or violation of rules governing self-reward. The results of this experiment suggest that the girls' rule violation was affected by the model's level of skill and by the interactor of the model's verbal and behavioral expression relevant to those rules. In the study, behavioral transgression increased when the children were presented with either a preacher or a practitioner of transgression. The model's behavior did not affect the children's verbal transmission.

Jensen & Young (1972, pp. 368-373) studied the effect of televised simulated instruction on subsequent teaching, since student teachers with experience of simulation should, theoretically at least, require less time for adjustment to teaching in a normal class. The writers consider microteaching to be simulating and are of the opinion that student teachers with microteaching experience should increase in proficiency faster than those not having had microteaching. In this investigation, the microteaching group obtained superior ratings on all but one measure. The fact that the microteaching group was not also better in the initial phase is explained with the suggestion that the effect may even increase after a period of time.

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To summarize

A large number of research reports exist in which studies concerning stipulated models of behavior and the process of externally mediated self-confrontation are presented. Of these studies, the only ones described here are those which can be considered important, either because they are relevant to the problems being investigated or because of the results obtained. In this context, too, the aim has been (1) to discover a common pattern in the results reported and (2) to find guidelines for future research work. The studies have been examined with regard to implications based on empirical results, which has led to the following main conclusions with regard to:

Perception

1. Pupils´ motivation and interest in the lesson being taught depends on the pupils´ perception of the student teacher´s behavioral style.
2. The effect of training in microsettings on student teachers´ ability of discrimination is inconclusive.
3. Exactly what aspects of teaching are influenced by factors which have been studied has not been determined.
4. It has not been determined exactly whether a permanent change occurs as the result of the self-confrontation techniques reviewed.

Evaluation

1. Audio-videotaped protocol material leads to a more correct evaluation of the teacher´s effectiveness than evaluation based on protocol material other than audiovideotapes
2. The validity of educational experts´ evaluation of student teachers´ effectiveness based on videotaped interview material is non-existent
3. Simulation combined with modelling procedures has noticeable effects on counselors´ acquisition of tacting behavior
4. Externally mediated self-confrontation via portable videotape recorders has not led to any demonstrable effect on in-service teachers´ evaluation of their questioning behavior
5. The effects of externally mediated self-confrontation techniques and/or tutoring on student teachers´ self-analysis have not been determined on the basis of existing experimental results. The empirical results are inconclusive
6. The effects of externally mediated self-confrontation and/or cueing

of models on videotape or film are inconclusive. Cueing in combination with self-confrontation can, however, be an advantage at the start of a training sequence, in order to facilitate the student teachers' discrimination. With increased training the importance is markedly reduced.

Behavior

1. Microsetting models as simulators for the simulation of behavior influences an individual's behavior
2. A model's behavior on videotape and verbal expression influences the pupil's behavior but not the verbal expression of the pupil
3. Microteaching models need not necessarily lead to initial behavioral change. This effect can prove to be amplified after a period of time
4. Whether or not externally mediated self-confrontation and/or tutoring facilitates student teachers' behavioral changes could not be determined. The experimental results are inconclusive.

There are many research reports, published mainly at Stanford and Far West, which present investigations and results on modelling, cueing and skill-training. Unfortunately, most of the literature is inconclusive or contradictory and reports intuitions and general conclusions. It appears that microteaching models have not yet been tested in a systematic research context. The variables of microsetting models (structuring, reduction of complexity, focussing of problems, feedback devices and evaluation procedures) have not been investigated in a systematic manner and under strict experimental control.

"Stanford Skills" and models on videotape are patterns of behavior that are related to one set of cues among the many available in a typical lesson. But they consist of some kind of surface structure, which has probably also led to inconclusive empirical results. What is of more fundamental importance is the student teachers' "deep structure", i.e. the ability to deploy and choose those skills in a situation with many degrees of freedom. It is the ability to perceive cues indicating that certain teaching skills are now appropriate, and the student teachers' speed and flexibility in choosing a course of action, which matters.

7. MICROSETTINGS: APPLICATIONS

Microteaching and microcounseling have been developed in the United States and have from there spread to many countries. For this reason, in the examination of the application of this model, I shall start with the USA.

In the United States a nationwide survey with the purpose of investigating the use of microteaching in secondary education programs accepted by the National Council for Accreditation of Teacher Education (Ward, B., 1970) showed that 176 secondary teacher education programs used microteaching. 144 of the institutions questioned answered a comprehensive questionnaire. 72% of those answering used microteaching in their general method courses and 18% in the teaching of trainees. 73% had in the school year 1968/69 been using microteaching for about 2 years. Many microteaching programs (66%), however, had only a small number of trainees (less than 150) involved in their courses. Most of the programs used "peer" students within the framework of so-called microclasses. Ward states that there appears to be a general lack of knowledge of the "technical skills of teaching as defined at Stanford". But many of those using microteaching had observed an improvement in attitudes towards education and in teaching skills both in the teacher trainers themselves and in the student teachers. 54 institutions used microteaching in the in-service education programs that are to be found in each regional area. Using the ranking given by Ward (1970, p. 37) the institutions approached considered the most essential technical skills of teaching to be (1) probing questions, (2) reinforcement, (3) asking questions, (4) higher order questions and (5) establishing sets.

When asked (Ward, B., 1970, p. 41) which changes in attitude the teacher trainers had observed in student teachers, who had been taught with the help of microteaching, the teacher trainers answered in the following order: (1) increased understanding of the teaching process as a complex challenging profession, (2) greater interest in and enthusiasm for education, (3) increased self-confidence, (4) greater concern for self-improvement and self-evaluation and (5) greater awareness of teaching image.

With regard to changes in teacher behavior, tutoring and the teacher trainers' own attitudes, Ward (1970, p. 42) states (1) increased focus of attention and teaching of specific teaching behavior, (2) have become a better model of good teaching, practice what I preached and (3) growing objectivity towards teaching, which became much more practical. Teacher trainers considered that they placed (4) more stress on the student teachers' participation than before and that the teaching less often took the form of lectures. Finally the teacher trainers also considered that they (5) much more often carried out "self-evaluation of own teacher behaviors" than before the use of microteaching models.

The main teaching programs for the institutions´ own teacher training staff are said to use the microteaching model for (1) in-school demonstrations, discussions and participation, (2) workshop attendance and (3) individual reading, self-instruction and experimentation.

Microsettings have been used both in educational programs for the training of pre-service and in-service teachers at all levels. The model has also been used for the simulation of teaching situations (Meier, 1968, p. 20). In a large program, simulation experiments were designed in order to instruct in-service teaching staff in flexible scheduling. Each training team made use of microteaching to try out and improve a curriculum before it was introduced into their own school or classroom. The CCTV/VR technique was used in this in order to evaluate its performance. Allen (1972, p. 15) states that over a hundred experienced teachers and several hundred students participated in this large-scale in-service training program.

Another application of the microsetting model consisted of a program developed at the Far West Laboratory for Educational Research and Development. The program is called "minicourse". The minicourse contains the following components: (1) instructional materials, films and instruments for evaluation, (2) microteaching elements and (3) a sequence of instruction.

The purpose of this course is to improve the teacher´s teaching behaviors by an application of principles and systematic techniques from the behavioral sciences, without needing to employ supervisors.

Microsetting models have been used in higher education, i. e. at university and college level, at the University of Massachusetts in order to obtain (1) a student-centered evaluation of professors´ teaching, (2) a teacher-centered evaluation of professors´ teaching and (3) a videotape of professors´ teaching (Allen, 1972, p. 17).

A microsetting model, "microcounseling", has been developed at the same university and has there been used among other things to teach (1) selective listening skills, (2) skills of self-expression and (3) expression of feelings and mutual communication.

Microsetting models have been used in the training of tutors in Massachusetts, in order to instruct supervisors in the component skills and to train tutors´ skills of discrimination in differentiating between these skills and their component behaviors. It is expected of the tutor that he be able to observe relations between the skills and the decisions that are of importance in the application of skills in complex pedagogic situations

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D. Young (1972, pp. 23-28) at the University of Maryland describes the application of simulation, microteaching, microclass, individual prescribed teaching, training modules, minicourses and microteam teaching, which follow the well-known concepts and procedures developed at Stanford and Far West.

In Israel Perlberg has started at the Teacher Training Department of the Technion in Haifa a whole series of studies and applications of microteaching models, in order both to make investigations and to use models in the training of teachers at university level. The investigations largely follow the program developed at the University of Massachusetts (see Perlberg et al, 1972, pp. 43-50; Perlberg, 1972, pp. 547-560).

In general it can be said that "decision making" is today felt to be the most important component (process) in all education and professional activities. For this reason, great stress should be placed on the development of an analysis model that is sufficiently specific for an analysis of behavior in microsettings. The majority of models in existence at present are too blunt to be used in experimental contexts. What are needed are diagnostic models that would make it possible for student teachers to analyse classroom behavior.

In England microteaching models have been used at the University of Liverpool. Teather (1972, p. 1) says that he has not used microteaching courses in the usual sense of the concept. He used the CCTV/VR technique as a feedback instrument in dialogue contexts. The main part of his course at Liverpool concerned a study of externally mediated feedback when the students ("Educators") themselves generated the information that they subsequently viewed on the screen of a TV monitor.

The purpose of this attempt to apply a simulation technique was to let the participants themselves develop alternative solutions to an a priori specified task. The solutions were then analysed with the whole group. Teather (1972, p. 10) writes that it is difficult to estimate how much of the success of the course can be traced to the "students'" enjoyment of role-playing in this simulation exercise and how far the success has been achieved by microsetting and the CCTV/VR technique.

Beattie & Teather (1972) has worked with a modified model of Stanford's "classical" microteaching model, partly because the situation at English universities is different, partly because they have smaller economic resources at their disposal. The microteaching unit consisted of 30-minute lessons that were divided into three parts. Each part was taken by one student teacher in a group of three. The work within this microteaching situation was centered on the subject and not on the teacher.

The pupils in the classes were fellow-students, i.e. it was a question of a role-playing situation. This deviation, say the writers, is in conflict with the requirement laid down by Allen & Ryan (1969) that microteaching should be real teaching.

Beattie & Teather (1972, p. 6) write that the factor that can be said to decide success or failure in a microteaching situation is the personality of the teacher, on which a supervisor can in any case be expected to have very little influence.

They point out that the effect of microteaching should be in a change of attitude and that neither skill in verbalization nor other "skills" have any significance. Each change in attitude worth speaking of is, in the opinion of the authors, neither direct nor observable. They query the value of breaking down teaching behaviors into skills (p. 9), even though the supervisor must strive to demonstrate a teaching situation in such a way as to make it transparent, i.e. as comprehensible and manageable as possible for the student teacher.

Finally the authors ask what should be done to teach the student teachers to choose just the skills that are required in a certain given situation. In this context they refer to Bjerstedt's (1968) attempt to develop a simulator test as being more fruitful in the development of suitable procedures in the training of student teachers.

In Germany microsetting models are used at 30 universities and colleges. This is shown in a survey carried out by Brunner (1973, pp. 269-278). 82 educational institutes were approached, of which 72 answered the questionnaires. The study shows that the Stanford "microteaching model" was used with a multitude of variations and that the applications appeared to encourage the development of observation instruments and standardized assessment scales. On the other hand the Germans do not seem to be as convinced (as many Americans) of the advantages of training teaching skills. They are instead more interested in the training and analysis of complex teacher behaviors, i.e. teaching strategies. Those questioned judge microteaching models to be very useful, however, even though there are only a relatively small number of students (approx. 1200) that have at all participated in courses based on these models.

The University of Tübingen, Zentrum für neue Lernverfahren, has since the summer of 1972 had a course in foreign languages based on the application of interactions analysis in a microsetting. The purpose of this activity is to realize (1) the introduction of goals and procedures, (2) teaching analysis in groups, (3) determination of teaching skills to be trained, (4) a training phase and the evaluation of teaching through the application of microteaching and the use of CCTV/VR techniques.

Beattie & Teather (1972, p. 6) write that the factor that can be said to decide success or failure in a microteaching situation is the personality of the teacher, on which a supervisor can in any case be expected to have very little influence.

They point out that the effect of microteaching should be in a change of attitude and that neither skill in verbalization nor other "skills" have any significance. Each change in attitude worth speaking of is, in the opinion of the authors, neither direct nor observable. They query the value of breaking down teaching behaviors into skills (p. 9), even though the supervisor must strive to demonstrate a teaching situation in such a way as to make it transparent, i.e. as comprehensible and manageable as possible for the student teacher.

Finally the authors ask what should be done to teach the student teachers to choose just the skills that are required in a certain given situation. In this context they refer to Bjerstedt's (1968) attempt to develop a simulator test as being more fruitful in the development of suitable procedures in the training of student teachers.

In Germany microsetting models are used at 30 universities and colleges. This is shown in a survey carried out by Brunner (1973, pp. 269-278). 82 educational institutes were approached, of which 72 answered the questionnaires. The study shows that the Stanford "microteaching model" was used with a multitude of variations and that the applications appeared to encourage the development of observation instruments and standardized assessment scales. On the other hand the Germans do not seem to be as convinced (as many Americans) of the advantages of training teaching skills. They are instead more interested in the training and analysis of complex teacher behaviors, i.e. teaching strategies. Those questioned judge microteaching models to be very useful, however, even though there are only a relatively small number of students (approx. 1200) that have at all participated in courses based on these models.

The University of Tübingen, Zentrum für neue Lernverfahren, has since the summer of 1972 had a course in foreign languages based on the application of interactions analysis in a microsetting. The purpose of this activity is to realize (1) the introduction of goals and procedures, (2) teaching analysis in groups, (3) determination of teaching skills to be trained, (4) a training phase and the evaluation of teaching through the application of microteaching and the use of CCTV/VR techniques.

Castrup (1972), a counselor in pre-school service, describes an innovation with CCTV/VR in pre-school education. The training difficulties in this area of education are rather complex. The greatest problem is said to be the very great variations in the educational backgrounds of the teachers. Videorecording for analytical self-confrontation has not been used and the use of microsetting models and CCTV/VR has been wholly dependent on the technical resources available. The special organizational and educational concept of pre-school education in this area emphasizes the special advantages that CCTV/VR equipment has in combination with microcounseling. 30 video-systems are planned, which should lead to a considerable improvement of "information processing" within pre-school organization and the transmission of information for training purposes in pre-schools. It is also assumed that a network of video-systems should enable the school to start self-directed innovations.

Heilig (1972), at the Pädagogische Hochschule in Schwäbisch Gmünd, conducted a course in the training of the analysis of teacher behavior. His experiment can be described as an exploration into the possibility of enriching the practice phase of the teacher training program. In this course, too, only certain elements of the classical microteaching model were used. Teaching sequences were videorecorded and the student teachers had to carry out interactions analyses with Flanders' observation schedule.

These and similar innovations of microsetting models indicate that teacher trainers are convinced that student teachers can be inducted into a permanent learning process that enables them (1) to plan their courses of action in a precise manner, (2) to realize these plans in a methodological way and finally (3) to control their progress by means of valid and reliable assessments.

In Sweden CCTV/VR techniques have been used since 1963, both in connection with research work (Bjerstedt, 1967 and 1969; Ljung & Naeslund, 1968 and 1969; Bierschenk, 1972 and 1973; Brusling, 1973), and for the development of videotaped teaching programs for use in the different stages of teacher training (Naeslund, 1969; Dahlgren & Zachrisson, 1971; Gran, 1973).

For the first five years, grants for Research and Development were mainly used for the development of institutes for CCTV/VR as part of the organization of the Schools of Education in Sweden. These institutes today produce centrally and regionally planned videotaped teaching programs that by means of compatible CCTV/VR can be used all over the country.

At present there is no systematic use of microsettings or self-confrontation via CCTV/VR techniques in ordinary school teaching in Sweden.

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To summarize:

There does not appear to be as great an application of microsetting models as one would have expected, considering the many positive statements that are to be found in the literature. Nor does the literature verify that the model is as widespread and as generally applied as its proponents claim it to be. Beattie & Teather (1971, p. 7) suggest that:

> " . . . it may be that the deepest impact of microteaching lies in its effect not on the trainee teacher's ability to verbalize about skills, nor even on his ability to perform skills, but on his attitudes."

The microteaching model was developed in America, but even there not many student teachers appear to participate in courses based on this model, compared with the total number of student teachers at universities and teacher training colleges. Technical skills as defined at Stanford have not elicited any particularly large response, even in America. In Europe, microsetting models have been used primarily in England, Sweden and Germany. But the idea of atomizing complex teacher behaviors into skills has not been received with any great enthusiasm. In Europe there is a more general interest in finding out how to teach student teachers to analyse behavior and train complex teaching strategies. A wider application of microsetting models has not been able to be observed in any of these countries.

Microteaching was developed at the University of Stanford and was promoted as a new model for training student teachers in the use of specified teaching skills. This approach was from the beginning praxis-orientated, which was expressed in, for example, the type of research that was carried out around the idea of microteaching. Allen points out quite correctly in the Foreword to Ivey's (1971, p. xi) book on microcounseling:

> "In the early phase of experimentation and research, conceptual frameworks and theoretical constructs were deliberately omitted in a search for a method which consistently showed results - a system that worked was needed rather than one which was theoretically sophisticated."

This study has shown explicitly that the results that Allen speaks of possibly refer to attitudes of student teachers and educators to the idea of microteaching. Other conclusive and consistent results have not been found. Allen's hope:

> "... that a theoretical structure for microteaching would evolve out of application and practice".

has not yet been realized. Far too many researchers and educators have taken up and applied the model far too orthodoxly, which has not exactly helped to develop the model as a welcome opportunity for "experimental education". The greatest obstacle to a successful development and application of the idea of microteaching is in my opinion its inadequate theoretical foundation. Nothing is as practical as a good theory.

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8. CONCLUDING POINTS OF VIEW

The guideline for this study which has conce mediated self-confrontation in connection with cher training has been the heuristic model presented in Chapter 3. Following th 's model, the investigations reviewed have been grouped according to whether the investigation in question has been carried out in order to map the effect of ternally mediated self-confrontation in (1) the absence or (2) the presence of stipulated models of behavior. In addition a note has been made of whether extern lly mediated self-confrontation techniques have been used for educational purposes or for therapeutic and counseling purposes.

The populations for the respective investigations are shown clearly by the context in which the study is carried out. The results presented by the reviewed investigations have been grouped with regard to whether the dependent variable(s) of the investigations indicated a measurement of (1) perception, (2) evaluation or (3) behavior.

This review was restricted to "externally mediated self-confrontation via closed circuit television and video-recording techniques in connection with microsettings". Microsettings as an independent variable have not been presented, but the results which have been reported in the literature are described in connection with stipulated models of behavior (Chapter 6). Experiences of the application of microsetting models are reported separately (Chapter 7).

There are both advantages and disadvantages in starting a review of literature with a model. One of the advantages is that the examination requires an a priori and explicit conceptualization by the reviewer. One of the disadvantages is that certain, perhaps important, investigations can fall outside this framework. In addition there are always alternative, possibly more satisfactory, models.

In Bierschenk (1972 a and c) an outline is given of a model with at least three dimensions, which could be useful for a systematic review of literature and a systematic investigation of the variable "externally mediated self-confrontation". In this model the x and y axes form the following relations: (1) ego-ego, (2) ego-pupil, (3) ego-nonpersonal objects, (4) pupil-ego, (5) pupil-pupil, (6) pupil-nonpersonal objects. At the third (z axes) these relations are coordinated with the attributes (1) appearance and environment, (2) emotion, (3) cognition and (4) communication. A hypothesis (Bierschenk, 1972 a, p. 83) put forward in connection with this model was:

"that the perceptual (modification of external signs) and the emotional (modification of internal signs) defence is assumed to develop into a focussing on cognitive and finally communicable aspects. ... It is assumed gations reviewed have been grouped according to whether in question has been carried out in order to map the effect of mediated self-confrontation in (1) the absence or (2) the presence o models of behavior. In addition a note has been made of whether extern mediated self-confrontation techniques have been used for educational purposes or for therapeutic and counseling purposes.

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> "that the perceptual (modification of external signs) and the emotional (modification of internal signs) defence is assumed to develop into a focussing on cognitive and finally communicable aspects. ... It is assumed

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that student teachers, after having explored the outward, emotional and cognitive aspects of the different objects, direct their attention to communicable aspects of behavior, which in this context implies a purposeful selection and transformation of information."

An examination of the available literature on the basis of this model would demand a careful study and review of the measurement instruments used in the studies reported. At the moment this type of work has been judged to lie outside the scope of this report, but a review in accordance with this model is strongly recommended.

After completing this report, I found an article by Fuller & Manning (1973, pp. 469-528) with the title: "Self-confrontation reviewed: A conceptualization for video playback in teacher education". It has unfortunately not been possible to include the writers' review and conclusions in detail in this study, but this review should be of use since it (1) was made on the basis of other principles of categorization, (2) presents investigations not reviewed in this study and (3) presents results and conclusions that on some points are in agreement with and on others differ from the results and conclusions arrived at in this study.

In broad outline, Fuller & Manning (1973, p. 472) reviewed literature on the confrontation variable, with special emphasis on studies "outside teacher education". The review is structured according to 32 subject headings. Many of the findings presented are a valuable complement, even if it is not easy to digest the "conceptualization" behind the review, but Fuller & Manning's (1973, p. 510) observation:

> "The whole sequence from discrepancy identification through discrepancy reduction needs to be examined"

follows the cybernetical approach expressed in this report.

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